

Workshop Manual

Audi A6 2011 ➤
Audi A6 China 2012 ➤
Audi A7 Sportback 2011 ➤

Auxiliary/supplementary heater

Edition 10.2017



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List of Workshop Manual Repair Groups

Repair Group

00 - Technical data

82 - Auxiliary heating



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Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

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00 – Technical data

1 General notes

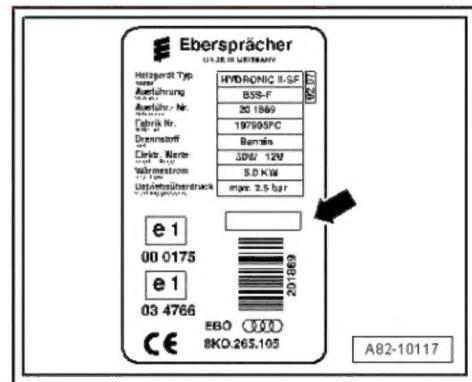
(ARL005287; Edition 10.2017)

- ⇒ [“1.1 Type plates”, page 1](#)
- ⇒ [“1.2 Notes on operation of auxiliary/supplementary heater on vehicles with diesel engine”, page 2](#)
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1.1 Type plates

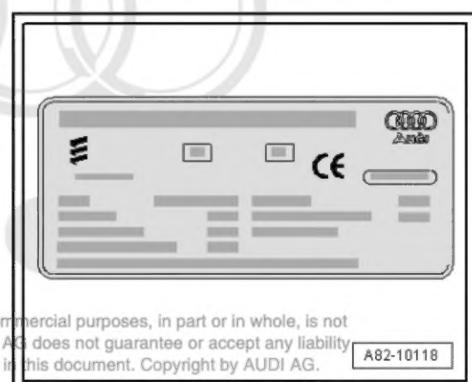
Factory label on auxiliary heater

- ◆ The most important technical data are entered in the top section of the factory label.
- ◆ There are different types of factory labels and type plates; the illustrations show the type plate and factory label that were valid at the start of production.
- ◆ If the auxiliary heater is renewed, the factory label duplicate must be checked and renewed if necessary.
- ◆ The year of initial commissioning is entered below the technical data.
- ◆ The “Genuine replacement part” type plate must indicate the year of initial commissioning -arrow-.
- ◆ It is not necessary to renew the heat exchanger on auxiliary heaters after 10 years. German legislation only requires the heat exchanger to be renewed on air heaters; it is therefore not necessary to renew the heat exchanger on this auxiliary heater.



Type plate on bonnet

- ◆ A second type plate (duplicate) is attached to the bonnet on the left side of the engine compartment (as seen in direction of travel). If there is any doubt about the type of auxiliary heater installed, always observe the type plate attached to the auxiliary heater itself.



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1.2 Notes on operation of auxiliary/supplementary heater on vehicles with diesel engine

Operation of the auxiliary heater may be impaired in cold weather (usually the only conditions under which the auxiliary heater is switched on) if vegetable or rapeseed methyl ester is used as fuel.

Reason:

Because of their physical properties, operation with vegetable or rapeseed methyl ester fuel may result in deposits forming in the auxiliary heater combustion chamber (burner element). These deposits can cause combustion problems if the vehicle is run with vegetable or rapeseed methyl ester fuel for lengthy periods (no flame and deflagration in combustion chamber).

1.3 Starting conditions for auxiliary/supplementary heater

- Coolant circuit has been bled.
- Battery condition OK: no deactivation due to low voltage
- There is enough fuel in the fuel tank.
- The auxiliary heater must have been adapted in the air conditioner front operating and display unit (Climatronic control unit - J255-). Coding ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- No fault is stored in the heater event memory.
- The ignition is off and "auxiliary heating" mode has been set.



Note

- ◆ Only the main steps of the operating sequence are outlined on the following pages.
- ◆ Some procedures taking place during auxiliary heater operation cannot be heard or measured ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ Depending on the vehicle equipment, the circulation pump - V55- may also be activated when requested by the corresponding engine control unit and the air conditioner front operating and display unit (Climatronic control unit - J255-) ⇒ [page 60](#) and ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ Depending on the coolant temperature and the setting on the air conditioner front operating and display unit (Climatronic control unit - N279-), the heater coolant shut-off valve - J255- may also be activated when the auxiliary heater is switched off ⇒ [page 16](#) and ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ The voltages, times and frequencies listed in the table are approximate values regulated by the control unit on the basis of measured values (voltage, temperature etc.).
- ◆ 1 hertz (Hz) corresponds to 1 pulse per second.

1.4 Notes on auxiliary/supplementary heater

- ◆ Various functions of the auxiliary heater are adjusted on the Multi Media Interface (MMI). Therefore please check the following settings in the MMI in the event of problems with the

auxiliary heater control or heating output: "A/C" and "Auxiliary heating" in "Car"/"Car systems" menu ⇒ Owner's Manual and ⇒ Infotainment/MMI Operating Manual .

- ◆ Vehicles with a diesel engine and auxiliary heating (optional equipment) are currently not fitted with an electric auxiliary air heater ⇒ Audi sales literature . On vehicles with an electric auxiliary air heater, the auxiliary heater is not activated as a "supplementary heater".
- ◆ Depending on the vehicle equipment and the production period, the electric auxiliary air heater may also be fitted at a later date on vehicles with an auxiliary heater fitted as an optional extra (not yet finalised) ⇒ Heating, air conditioning; Rep. gr. 87 ; Heater and air conditioning unit (front); Exploded view - heater and air conditioning unit.

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- ◆ Vehicles with a diesel engine but no auxiliary heater are always fitted with an electric auxiliary heater. Heat energy is supplied to the air immediately after it leaves the heat exchanger of the air conditioning unit ⇒ Audi sales literature .
- ◆ On vehicles with a petrol engine, the auxiliary heater is currently not activated as a "supplementary heater". An electric auxiliary air heater is currently not installed.
- ◆ This auxiliary heater is fitted in various vehicle models. The part number may change with each new vehicle model in which this auxiliary heater is installed. It is therefore important to observe the correct assignment. An old auxiliary heater version must never be installed in a vehicle that was previously fitted with a newer version ⇒ Electronic parts catalogue .
- ◆ Pay attention to correct coding for the vehicle concerned (different functions are stored in the control unit depending on the type of vehicle coded) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ If the entry "Wrong control unit fitted" is displayed after renewing the auxiliary heater or the auxiliary heater control unit - J364- , check that the auxiliary heater control unit - J364- has been coded for the correct type of fuel (diesel or petrol) and correct if necessary ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ Depending on the selected mode ("Auxiliary heating" or "Auxiliary ventilation"), certain faults which impair the auxiliary heating/auxiliary ventilation are not stored in the event memory of the auxiliary heater control unit - J364- . Therefore, if there is a problem with the auxiliary heater, also read out the event memory of the air conditioner operating unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ Some of the auxiliary heater components listed individually in the following exploded view are not available as separate replacement parts. They are combined in various repair sets ⇒ Electronic parts catalogue .
- ◆ From 06.2011 onwards, modified auxiliary heaters have been in use (changes to auxiliary heater control unit - J364- , different glow plugs for heater - Q9- , different burner elements for diesel heaters and modified moulded gasket for petrol heaters). Check the correct version and allocation of these parts prior to installation ⇒ Electronic parts catalogue .



1.5 Operating sequence for auxiliary heater

⇒ "1.5.1 Operating sequence - switching on auxiliary heater".

[page 4](#)

⇒ "1.5.2 Operating sequence - auxiliary heater heating mode".

[page 7](#)

⇒ "1.5.3 Operating sequence - switching off auxiliary heater".

[page 10](#)

⇒ "1.5.4 Operating sequence - auxiliary ventilation", [page 12](#)

⇒ "1.5.5 Measured values and components monitored during operating sequence", [page 13](#)

⇒ "1.5.6 Sequence with required heat output between 50 and 100 %", [page 14](#)

⇒ "1.5.7 Sequence with required heat output less than 50 %",

[page 15](#)



1.5.1 Operating sequence - switching on auxiliary heater



Note

- ◆ *Vehicles with diesel engine and "auxiliary heater" as an optional extra are currently not fitted with an auxiliary air heater element - Z35- as an optional extra.*
- ◆ *On vehicles with an auxiliary air heater element - Z35- and fitted with an auxiliary heater, this is not activated as supplementary heater (use of the auxiliary air heater element - Z35- on vehicles fitted with an auxiliary heater as optional extra has not yet been finalised).*

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No.	Operating sequence
1	<p>Cut-in signal</p> <p>Auxiliary heater:</p> <ul style="list-style-type: none">• Signal from air conditioner operating unit (Climatronic control unit - J255-) via data bus, setting is specified on Multi Media Interface (MMI, control unit for front display and information control panel - J523-)• Signal from remote control receiver for auxiliary heater - R64-• Signal from vehicle diagnostic tester (via basic setting function)- Reading out air conditioner operating unit (Climatronic control unit - J255-) (via data bus) <p>Supplementary heater (only on vehicles with diesel engine without auxiliary air heater element - Z35-):</p> <ul style="list-style-type: none">• Signal from air conditioner operating unit (Climatronic control unit - J255-) (via data bus)• Signal from vehicle diagnostic tester (via basic setting function)
2	<p>Initiating start procedure</p> <p>Auxiliary heater:</p> <ul style="list-style-type: none">• The air conditioner operating unit (Climatronic control unit - J255-) determines that heating mode is required to attain the specified temperature in the passenger compartment.- Checking of measured values and components by interrogating event memory, power supply, coolant temperature and checking of all electrical components and input signals ⇒ page 13- Initiation of start procedure

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	Supplementary heater (only on vehicles with diesel engine without auxiliary air heater element - Z35-): – Checking of measured values and components by interrogating event memory, power supply, coolant temperature and checking of all electrical components and input signals ⇒ page 13 – Initiation of start procedure																																																											
	Possible deviations; start procedure not initiated																																																											
	Auxiliary heater: • The air conditioner operating unit (Climatronic control unit - J255-) determines that heating mode is not required to attain the specified temperature in the passenger compartment. – Auxiliary ventilation (summer mode) ⇒ page 12																																																											
3	Starting 3.1 Starting (diesel) <ul style="list-style-type: none"> • No deviation in measured values and components monitored ⇒ page 13 – Activation of circulation pump - V55- and heater coolant shut-off valve - N279- – Voltage supplied briefly at combustion air blower - V6- – Voltage at glow plug for heater - Q9- <table border="1"> <thead> <tr> <th>Components</th> <th>Activation with</th> <th>Duration approx.</th> </tr> </thead> <tbody> <tr> <td>Combustion air blower - V6- (regulated)</td> <td>approx. 8 V</td> <td>5 sec.</td> </tr> <tr> <td>Metering pump - V54- (regulated)</td> <td>0 Hz</td> <td>-</td> </tr> <tr> <td>Glow plug for heater - Q9-</td> <td>8 V</td> <td>35 sec.</td> </tr> </tbody> </table> <ul style="list-style-type: none"> – Activation of combustion air blower - V6- (supply) <table border="1"> <thead> <tr> <th>Components</th> <th>Activation with</th> <th>Duration approx.</th> </tr> </thead> <tbody> <tr> <td>Combustion air blower - V6- (regulated)</td> <td>approx. 8 V</td> <td>7 sec.</td> </tr> <tr> <td>Metering pump - V54- (regulated)</td> <td>0 Hz</td> <td>-</td> </tr> <tr> <td>Glow plug for heater - Q9-</td> <td>8 V</td> <td>7 sec.</td> </tr> </tbody> </table> <ul style="list-style-type: none"> – Reduced voltage at combustion air blower - V6- – Activation of metering pump - V54- (fuel pre-supply, regulated, start-up sequence). <table border="1"> <thead> <tr> <th>Components</th> <th>Activation with</th> <th>Duration approx.</th> </tr> </thead> <tbody> <tr> <td>Combustion air blower - V6- (regulated)</td> <td>6 to 4 V</td> <td>26 sec.</td> </tr> <tr> <td>Metering pump - V54- (regulated)</td> <td>approx. 4 Hz</td> <td>26 sec.</td> </tr> <tr> <td>Glow plug for heater - Q9-</td> <td>approx. 8 V</td> <td>26 sec.</td> </tr> </tbody> </table> <ul style="list-style-type: none"> – Increased voltage at combustion air blower - V6- (monitoring time) – Slightly increased regulation at metering pump - V54- (fuel pre-supply, regulated) <table border="1"> <thead> <tr> <th>Components</th> <th>Activation with</th> <th>Duration approx.</th> </tr> </thead> <tbody> <tr> <td>Combustion air blower - V6- (regulated)</td> <td>4 to 9 V</td> <td>37 sec.</td> </tr> <tr> <td>Metering pump - V54- (regulated)</td> <td>4 to 5 Hz</td> <td>37 sec.</td> </tr> <tr> <td>Glow plug for heater - Q9- (pre-heating, regulated)</td> <td>8 V</td> <td>37 sec.</td> </tr> </tbody> </table> <ul style="list-style-type: none"> – Voltage at combustion air blower - V6- slightly increased to full load – Clock frequency of metering pump - V54- increased to full load <table border="1"> <thead> <tr> <th>Components</th> <th>Activation with</th> <th>Duration approx.</th> </tr> </thead> <tbody> <tr> <td>Combustion air blower - V6- (regulated)</td> <td>approx. 9 V</td> <td>15 sec.</td> </tr> <tr> <td>Metering pump - V54- (regulated)</td> <td>5 to 8 Hz</td> <td>15 sec.</td> </tr> </tbody> </table>			Components	Activation with	Duration approx.	Combustion air blower - V6- (regulated)	approx. 8 V	5 sec.	Metering pump - V54- (regulated)	0 Hz	-	Glow plug for heater - Q9-	8 V	35 sec.	Components	Activation with	Duration approx.	Combustion air blower - V6- (regulated)	approx. 8 V	7 sec.	Metering pump - V54- (regulated)	0 Hz	-	Glow plug for heater - Q9-	8 V	7 sec.	Components	Activation with	Duration approx.	Combustion air blower - V6- (regulated)	6 to 4 V	26 sec.	Metering pump - V54- (regulated)	approx. 4 Hz	26 sec.	Glow plug for heater - Q9-	approx. 8 V	26 sec.	Components	Activation with	Duration approx.	Combustion air blower - V6- (regulated)	4 to 9 V	37 sec.	Metering pump - V54- (regulated)	4 to 5 Hz	37 sec.	Glow plug for heater - Q9- (pre-heating, regulated)	8 V	37 sec.	Components	Activation with	Duration approx.	Combustion air blower - V6- (regulated)	approx. 9 V	15 sec.	Metering pump - V54- (regulated)	5 to 8 Hz	15 sec.
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<ul style="list-style-type: none"> - Combustion air blower - V6- set to full load - Clock frequency of metering pump - V54- set to full load - Deactivation of glow plug for heater - Q9- (start of full load operation) 																																																							
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3.2 Starting (petrol)	<ul style="list-style-type: none"> • No deviation in measured values and components monitored ⇒ page 13 - Signal for activation of circulation pump - V55- and heater coolant shut-off valve - N279- - Voltage supplied briefly at combustion air blower - V6- - Voltage at glow plug for heater - Q9- 																																																						
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No.	Operating sequence		
	Metering pump - V54- (regulated)	3 to 6 Hz	17 sec.
	Glow plug for heater - Q9- (pre-heating, regulated)	approx. 8 V	17 sec.
<ul style="list-style-type: none"> - Increased clock frequency of metering pump - V54- - Deactivation of glow plug for heater - Q9- 			
	Components	Activation with	Duration approx.
	Combustion air blower - V6- (regulated)	8 V	20 sec.
	Metering pump - V54- (regulated)	6 to 7 Hz	20 sec.
	Glow plug for heater - Q9-	0 V	-
<ul style="list-style-type: none"> - Voltage at combustion air blower - V6- slightly increased to full load (monitoring time) - Increased clock frequency of metering pump - V54- to full load (start of full load operation) 			
	Components	Activation with	Duration approx.
	Combustion air blower - V6- (regulated)	approx. 9 V	approx. 45 sec.
	Metering pump - V54- (regulated)	7 to 8 Hz	approx. 45 sec.
	Glow plug for heater - Q9- (pre-heating, regulated)	0 V	-
<ul style="list-style-type: none"> - Start of heating operation ⇒ page 7 			
3.3	Possible deviations, start procedure is not initiated.		
	<ul style="list-style-type: none"> • Deviation in measured values and components monitored. By interrogation of event memory, power supply, coolant temperature and checking of all electrical components and input signals ⇒ page 13. - Start procedure terminated • Resistance of flame monitor - G64- outside specified range ⇒ page 13 - Termination of process (1 x restart) • Resistance of glow plug for heater - Q9- outside specified range even after restart Interrogation of resistance of glow plug for heater - Q9- (remains hot) ⇒ page 13 - Termination of procedure (entry in event memory)/fault/off 		



Note

- ◆ Activation of the heater coolant shut-off valve - N279- is governed by temperature [⇒ page 16](#).
- ◆ The air conditioner operating unit (Climatronic control unit - J255-) is switched on by the auxiliary heater control unit - J364- as soon as the coolant temperature in the auxiliary heater exceeds a value of approx. 40 - 50 °C. The exact cut-in temperature depends on the version of the auxiliary heater. The air conditioner operating unit (Climatronic control unit - J255-) then activates the various air conditioner control motors and the fresh air blower - V2- in auxiliary heating mode.

1.5.2 Operating sequence - auxiliary heater heating mode

No.	Operating sequence
1	<p>Full-load heating (max. heating output)</p> <ul style="list-style-type: none"> • Coolant temperature in heater less than 77 °C • No deviation in measured values and components monitored ⇒ page 13 • Resistance of flame monitor - G64- in specified range



No.	Operating sequence		
	Components	Activation with	Duration approx.
	<ul style="list-style-type: none"> - Combustion air blower - V6- set to full load - Clock frequency of metering pump - V54- set to full load - Checking of flame formation by flame monitor - G64- 		
	Combustion air blower - V6- (regulated)	approx. 9 V	Until coolant temperature in heater reaches 77 °C
	Metering pump - V54- (regulated)	approx. 8 Hz	Until coolant temperature in heater reaches 77 °C
	Glow plug for heater - Q9-	0 V	-
	<ul style="list-style-type: none"> • Coolant temperature in heater remains below 77 °C. <ul style="list-style-type: none"> - Heater remains in full load operation until it is switched off. • Coolant temperature in heater reaches 77 °C. <ul style="list-style-type: none"> - Switching from full load to part load operation (coolant temperature in heater reaches 77 °C). 		
	Possible deviations in full-load heating mode (max. heating output)		
	<ul style="list-style-type: none"> • Voltage drops below specified shut-off voltage. • Burn-off (entry in event memory)/fault/off. • Flame goes out. • Burn-off and re-start. 		
2	Part load operation (approx. 50 % of heat output)		
2.1	Part load operation (diesel)		
	Switching from full load to part load operation (approx. 50 % of heat output):		
	<ul style="list-style-type: none"> • Coolant temperature in heater increases and reaches 77 °C. • No deviation in measured values and components monitored ⇒ page 13 • Resistance of flame monitor - G64- in specified range - Reduced voltage at combustion air blower - V6- - Reduced clock frequency of metering pump - V54- - Checking of flame formation by flame monitor - G64- - Activation of heater coolant shut-off valve - N279- , governed by temperature ⇒ page 16 		
	Components	Activation with	Duration approx.
	Combustion air blower - V6- (regulated)	from approx. 9 V to approx. 6 V	5 sec.
	Metering pump - V54- (regulated)	approx. 4 Hz	5 sec.
	Glow plug for heater - Q9-	0 V	-
	<ul style="list-style-type: none"> - Combustion air blower - V6- set to part load - Clock frequency of metering pump - V54- set to part load - Checking of flame formation by flame monitor - G64- 		
	Components	Activation with	Duration approx.

No.	Operating sequence		
	Combustion air blower - V6- (regulated)	approx. 6 V	Until coolant temperature in heater drops below 60 °C or reaches 89 °C
	Metering pump - V54- (regulated)	approx. 4 Hz	Until coolant temperature in heater drops below 60 °C or reaches 89 °C
	Glow plug for heater - Q9-	0 V	-
<ul style="list-style-type: none"> • Coolant temperature in heater reaches 89 °C. <ul style="list-style-type: none"> – Switching from part load operation to control interval • Coolant temperature in heater drops below 60 °C. <ul style="list-style-type: none"> – Switching from part load to full load operation • Coolant temperature in heater remains between 60 °C and 89 °C. <ul style="list-style-type: none"> – Heater remains in full load operation until it is switched off. 			
2.2	Part load operation (petrol) Switching from full load to part load operation (approx. 50 % of heat output): <ul style="list-style-type: none"> • Coolant temperature in heater increases and reaches 77 °C. • No deviation in measured values and components monitored ⇒ page 13 • Resistance of flame monitor - G64- in specified range – Reduced voltage at combustion air blower - V6- – Reduced clock frequency of metering pump - V54- – Checking of flame formation by flame monitor - G64- – Activation of heater coolant shut-off valve - N279-, governed by temperature ⇒ page 16 		
	Components	Activation with	Duration approx.
	Combustion air blower - V6- (regulated)	from approx. 9 V to 5 V	5 sec.
	Metering pump - V54- (regulated)	approx. 2 Hz	5 sec.
	Glow plug for heater - Q9-	0 V	-
	<ul style="list-style-type: none"> – Combustion air blower - V6- set to part load – Clock frequency of metering pump - V54- set to part load – Checking of flame formation by flame monitor - G64- 		
	Components	Activation with	Duration approx.
	Combustion air blower - V6- (regulated)	5 V	Until coolant temperature in heater drops below 60 °C or reaches 89 °C



No.	Operating sequence															
	Metering pump - V54- (regulated)	2 Hz	Until coolant temperature in heater drops below 60 °C or reaches 89 °C													
	Glow plug for heater - Q9-	0 V	-													
<ul style="list-style-type: none"> • Coolant temperature in heater reaches 89 °C. <ul style="list-style-type: none"> – Switching from part load operation to control interval • Coolant temperature in heater drops below 60 °C. <ul style="list-style-type: none"> – Switching from part load to full load operation • Coolant temperature in heater remains between 60 °C and 89 °C. <ul style="list-style-type: none"> – Heater remains in full load operation until it is switched off. 																
3	Control interval <ul style="list-style-type: none"> • Coolant temperature in heater increases and reaches 89 °C. • No deviation in measured values and components monitored ⇒ page 13 • Resistance of flame monitor - G64- in specified range <ul style="list-style-type: none"> – No regulation of combustion air blower - V6- – No regulation of metering pump - V54- – No regulation of glow plug for heater - Q9- <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Components</th><th style="text-align: center;">Activation with</th><th style="text-align: center;">Duration approx.</th></tr> </thead> <tbody> <tr> <td>Combustion air blower - V6-</td><td>0 V</td><td>-</td></tr> <tr> <td>Metering pump - V54- .</td><td>0 Hz</td><td>-</td></tr> <tr> <td>Glow plug for heater - Q9-</td><td>0 V</td><td>-</td></tr> </tbody> </table> <ul style="list-style-type: none"> • Coolant temperature in heater remains above 65 °C. – Heater remains in control interval until it is switched off. • Coolant temperature in heater drops below 65 °C. – Starting from control interval ⇒ page 4 				Components	Activation with	Duration approx.	Combustion air blower - V6-	0 V	-	Metering pump - V54- .	0 Hz	-	Glow plug for heater - Q9-	0 V	-
Components	Activation with	Duration approx.														
Combustion air blower - V6-	0 V	-														
Metering pump - V54- .	0 Hz	-														
Glow plug for heater - Q9-	0 V	-														



Note

When starting from the control interval, the times for the various procedures differ from those when re-starting, as the heater is already at operating temperature (e.g. pre-heating for 20 instead of 35 seconds, fuel delivery for 30 instead of 56 seconds).

1.5.3 Operating sequence - switching off auxiliary heater

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No.	Operating sequence
1	Shut-off signal

No.	Operating sequence																																				
	<p>Auxiliary heater:</p> <ul style="list-style-type: none"> Signal from air conditioner operating unit (Climatronic control unit - J255-) via data bus, setting is specified on Multi Media Interface (MMI, control unit for front display and information control panel - J523-) Signal from remote control receiver for auxiliary heater - R64- to auxiliary heater control unit - J364- <p>Supplementary heater (only on vehicles with diesel engine without auxiliary air heater element - Z35-):</p> <ul style="list-style-type: none"> Signal from air conditioner operating unit (Climatronic control unit - J255-) (via data bus) Signal from vehicle diagnostic tester (via basic setting function) 																																				
2	<p>Burn-off / run-on (cooling down of heater)</p> <ul style="list-style-type: none"> No deviation in measured values and components monitored ⇒ page 13 <p>2.1 Diesel</p> <ul style="list-style-type: none"> Increased voltage at combustion air blower - V6- Deactivation of metering pump - V54- Voltage at glow plug for heater - Q9- <table border="1"> <thead> <tr> <th>Components</th> <th>Activation with</th> <th>Duration approx.</th> </tr> </thead> <tbody> <tr> <td>Combustion air blower - V6-</td> <td>6 to 9 V</td> <td>20 sec.</td> </tr> <tr> <td>Metering pump - V54- .</td> <td>0 Hz</td> <td>-</td> </tr> <tr> <td>Glow plug for heater - Q9- (afterglow, regulated)</td> <td>approx. 8 V</td> <td>20 sec.</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Deactivation of glow plug for heater - Q9- <table border="1"> <thead> <tr> <th>Components</th> <th>Activation with</th> <th>Duration approx.</th> </tr> </thead> <tbody> <tr> <td>Combustion air blower - V6-</td> <td>approx. 9 V</td> <td>100 sec.</td> </tr> <tr> <td>Metering pump - V54- .</td> <td>0 Hz</td> <td>-</td> </tr> <tr> <td>Glow plug for heater - Q9- (afterglow, regulated)</td> <td>0 V</td> <td>-</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Deactivation of circulation pump - V55- and heater coolant shut-off valve - N279- <p>2.2 Petrol</p> <ul style="list-style-type: none"> Increased voltage at combustion air blower - V6- Deactivation of metering pump - V54- Deactivation of glow plug for heater - Q9- <table border="1"> <thead> <tr> <th>Components</th> <th>Activation with</th> <th>Duration approx.</th> </tr> </thead> <tbody> <tr> <td>Combustion air blower - V6-</td> <td>approx. 9 V</td> <td>0 to 120 sec.</td> </tr> <tr> <td>Metering pump - V54- .</td> <td>0 Hz</td> <td>-</td> </tr> <tr> <td>Glow plug for heater - Q9-</td> <td>0 V</td> <td>-</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Deactivation of circulation pump - V55- and heater coolant shut-off valve - N279- 	Components	Activation with	Duration approx.	Combustion air blower - V6-	6 to 9 V	20 sec.	Metering pump - V54- .	0 Hz	-	Glow plug for heater - Q9- (afterglow, regulated)	approx. 8 V	20 sec.	Components	Activation with	Duration approx.	Combustion air blower - V6-	approx. 9 V	100 sec.	Metering pump - V54- .	0 Hz	-	Glow plug for heater - Q9- (afterglow, regulated)	0 V	-	Components	Activation with	Duration approx.	Combustion air blower - V6-	approx. 9 V	0 to 120 sec.	Metering pump - V54- .	0 Hz	-	Glow plug for heater - Q9-	0 V	-
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 Note

- ◆ In "auxiliary heating mode", the auxiliary heater is switched off automatically by the air conditioner operating unit (Climatronic control unit - J255-) after a maximum of 60 minutes. The auxiliary heating/auxiliary ventilation operating time is specified on the Multi Media Interface (MMI, control unit for front display and information control panel - J523-).
- ◆ If the heater is shut off while it is in the control interval, it cuts out without burn-off and run-on.
- ◆ As the supplementary heater (vehicles with diesel engine without auxiliary air heater element - Z35- only, use of -Z35- and discontinuation of this auxiliary heater function not yet finalised) is operated with the engine running, it is hardly noticeable during heater operation. Heater run-on is audible if the engine is switched off.

1.5.4 Operating sequence - auxiliary ventilation

No.	Operating sequence
1	<p>Cut-in signal</p> <ul style="list-style-type: none"> • Signal from remote control receiver for auxiliary heater - R64- to auxiliary heater control unit - J364- • Signal from control unit for front display and information control panel - J523- via data bus to Climatronic control unit - J255- – Read out air conditioner operating unit (Climatronic control unit - J255-) (via data bus) ⇒ page 4. – Activation of -J255- "On". <p>Possible deviations</p> <ul style="list-style-type: none"> • The air conditioner operating unit (Climatronic control unit - J255-) determines that heating mode is required to attain the specified temperature in the passenger compartment. – Auxiliary heating (winter conditions)
2	<p>Shut-off signal</p> <ul style="list-style-type: none"> • Deactivation signal from remote control receiver for auxiliary heater - R64- – Information to air conditioner operating unit (Climatronic control unit - J255-) via data bus – Activation of air conditioner operating unit (Climatronic control unit - J255-) "Off"

 Note

- ◆ In auxiliary ventilation mode, the auxiliary heater control unit - J364- is only required to switch the signal from the remote control receiver for auxiliary heater - R64- to the data bus.
- ◆ If auxiliary ventilation mode has been selected in the Multi Media Interface (MMI, control unit for front display and information control panel - J523-) or if the air conditioner operating unit (Climatronic control unit - J255-) has established that the auxiliary heating mode is not required to attain the specified temperature in the passenger compartment, the auxiliary heater control unit - J364- is not activated.

1.5.5 Measured values and components monitored during operating sequence

Measured values and components	Operating sequence
Interrogation of event memory	<ul style="list-style-type: none"> • No entry in event memory - Heating mode control sequence • Fault-induced interlock entered - Termination of procedure/fault/off
Interrogation of voltage at heater	<ul style="list-style-type: none"> • Voltage greater than specified shut-off voltage - Heating mode control sequence • Voltage is less than or drops below specified shut-off voltage - Termination of procedure (entry in event memory)/fault/off
Interrogation of information from data bus diagnostic interface - J533-	<ul style="list-style-type: none"> • Voltage greater than specified shut-off voltage - Heating mode control sequence • Voltage is less than or drops below specified shut-off voltage - Termination of procedure (entry in event memory)/fault/off
Monitoring of all electrical components and input signals	<ul style="list-style-type: none"> • No faults detected - Heating mode control sequence • Fault detected - See above ⇒ page 4 <p>and ⇒ page 7.</p>
Interrogation of flame monitor - G64-	<ul style="list-style-type: none"> • Resistance of flame monitor - G64- in specified range - Heating mode control sequence • Resistance of flame monitor - G64- outside specified range - Termination of process (1 x restart) • Resistance of flame monitor - G64- outside specified range even after start repetition - Termination of procedure (entry in event memory)/fault/off
Interrogation of coolant temperature in heater (less than 81 °C)	<ul style="list-style-type: none"> • Coolant temperature (81 °C or less) - Heating mode control sequence

Measured values and components	Operating sequence
	<ul style="list-style-type: none"> • Coolant temperature (greater than 81 °C) – Switch to control interval

 Note

- ◆ **The resistance characteristic curve of the flame monitor - G64- enables the auxiliary heater control unit - J364- to detect whether a flame has formed in the heater.**
- ◆ **The heater is interlocked following three consecutive unsuccessful attempted starts involving the same fault ⇒ Vehicle diagnostic tester.**
- ◆ **If the heater has been interlocked due to a fault, the event memory must be read out and the content of the event memory erased. Depending on the cause of the fault, it may also be necessary to cancel the interlock via the "Adaption" function ⇒ Vehicle diagnostic tester ("Guided Fault Finding").**

1.5.6 Sequence with required heat output between 50 and 100 %

P (kW) = Heat output in kilowatts

t (°C) = Temperature of coolant in heater (degrees Celsius)

A = Starting procedure begins

– The coolant temperature in the heater must be less than 60 ° C.

B = Starting procedure

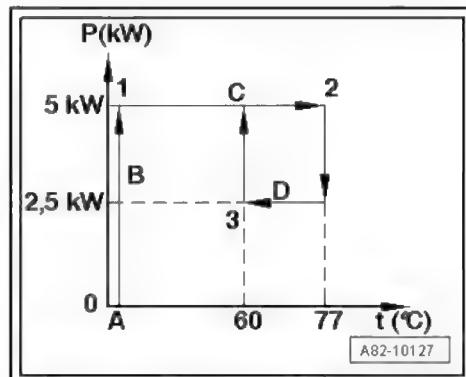
C = Full load operation

D = Part load operation

1 = Start of full load operation

2 = Switchover from full to part load operation

3 = Switchover from part to full load operation



1.5.7 Sequence with required heat output less than 50 %

P (kW) = Heat output in kilowatts

t (°C) = Temperature of coolant in heater (degrees Celsius)

A = Start procedure begins (coolant temperature in heater must be less than 60 °C)

B = Starting procedure

C = Full load operation

D = Part load operation

E = Control interval

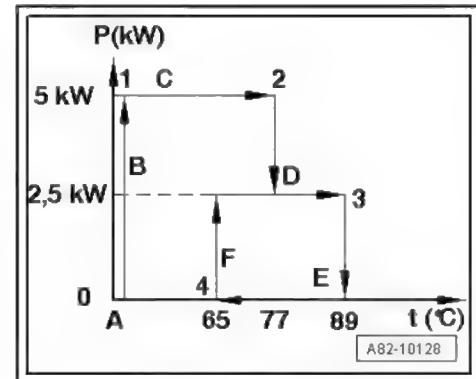
F = Starting from control interval

1 = Start of full load operation

2 = Switchover from full to part load operation

3 = Switchover from part load operation to control interval

4 = End of control interval



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1.6 Checking operation of coolant shut-off valve

⇒ "1.6.1 Operation of heater coolant shut-off valve N279",
[page 16](#)

⇒ "1.6.2 Activation of heater coolant shut-off valve N279",
[page 16](#)

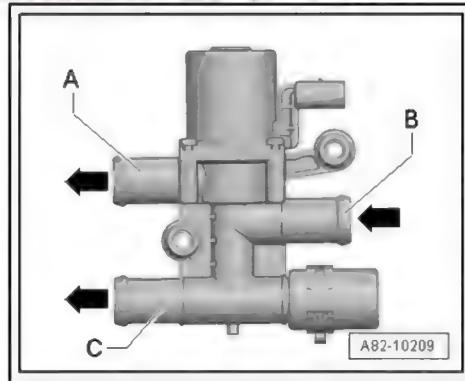
1.6.1 Operation of heater coolant shut-off valve - N279-

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Note

- ◆ The fitting location, designation and version of the heater coolant shut-off valve - N279- depend on the version and equipment of the vehicle. It is therefore important to observe the correct assignment ⇒ *Electronic parts catalogue*.
- ◆ If voltage is applied to the heater coolant shut-off valve - N279- (small coolant circuit), the coolant flows from the connection -B- (from the heat exchanger in the air conditioning unit) to the connection -C- (to the circulation pump - V55-).
- ◆ If voltage is not applied to the heater coolant shut-off valve - N279- (large coolant circuit), the coolant flows from the connection -B- (from the heat exchanger in the air conditioning unit) to the connection -A- (to the engine).
- ◆ There are different versions of the heater coolant shut-off valve - N279- (with three or four connections for coolant hoses; on the version with four connections, one connection is sealed with a cap).
- ◆ In auxiliary heating mode, the heater coolant shut-off valve - N279- is activated by the auxiliary heater control unit - J364- until the coolant temperature in the auxiliary heater has reached a specified level ⇒ *Vehicle diagnostic tester ("Guided Fault Finding")* and ⇒ [page 16](#).
- ◆ Depending on the vehicle version, the engine installed, the coolant temperature and the setting on the air conditioner operating unit (Climatronic control unit - J255-), the heater coolant shut-off valve - N279- may also be activated by the auxiliary heater control unit - J364- with the auxiliary heater switched off. In this case, the activation is a response to a request from the air conditioner operating unit (Climatronic control unit - J255-) via the data bus ⇒ *Vehicle diagnostic tester ("Guided Fault Finding")*.
- ◆ If there are problems with poor heating of the passenger compartment in auxiliary heating mode and poor heating of the passenger compartment when the engine is running, check the incorporation of the heater coolant shut-off valve - N279- into the coolant circuit, the activation of the heater coolant shut-off valve - N279- by the auxiliary heater control unit - J364-, and the installation position of the non-return valve ⇒ "3.1 Connection diagram - coolant hoses", [page 76](#), ⇒ *Vehicle diagnostic tester ("Guided Fault Finding")* and ⇒ [Item 6 \(page 77\)](#).



1.6.2 Activation of heater coolant shut-off valve - N279-

- The operating unit of the Climatronic control unit - J255- calculates the heating period of the auxiliary heater such that the specified passenger compartment temperature is attained at the selected time. This means that the auxiliary heater gener-

ally remains in full load mode and the coolant temperature remains below the threshold for switching to the large circuit.

- There is currently no provision for pre-heating the engine.
- This illustration shows one possible example of heater coolant shut-off valve - N279- activation. As the auxiliary heater control system on this vehicle already switches to part load at a coolant temperature of approx. 77°C, it rarely switches to the large circuit.



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A = This proportion of the coolant in % is conveyed in the large coolant circuit.

- If the heater coolant shut-off valve - N279- is not activated, 100 % of the coolant is delivered in the large circuit (via the engine to the auxiliary heater).
- If the heater coolant shut-off valve - N279- is constantly activated, 100 % of the coolant is delivered in the small circuit (directly from the heat exchanger in the air conditioning unit to the auxiliary heater).
- The heater coolant shut-off valve - N279- is activated by the auxiliary heater control unit - J364- in line with the coolant temperature and the specified request.

B = Temperature of coolant in auxiliary heater in °C (degrees Celsius).

C = Activation signal for auxiliary heater (the heater coolant shut-off valve - N279- is activated and the coolant flows back from the heat exchanger in the air conditioning unit to the auxiliary heater).

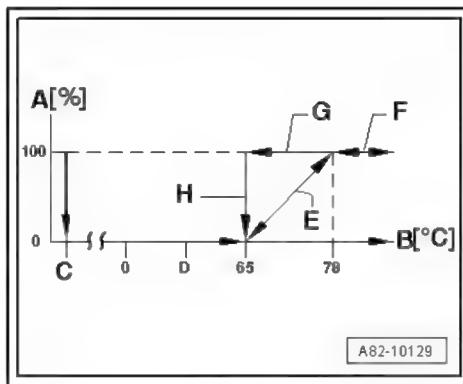
D = The auxiliary heater is in auxiliary heating full load mode; the coolant temperature increases (or remains constant). All the coolant drawn in by the circulation pump - V55- comes from the air conditioner heat exchanger.

E = The auxiliary heater is in auxiliary heating full or part load mode. Depends on the characteristic curve stored in the auxiliary heater control unit - J364-. The coolant temperature increases (or remains constant) and the proportion of the coolant (drawn in by the circulation pump - V55-) which flows back via the engine to the auxiliary heater is regulated by the auxiliary heater control unit - J364-. This operating status is encountered rarely or not at all on this vehicle due to the auxiliary heater control system.

F = All the coolant drawn in by the circulation pump - V55- flows back via the engine to the auxiliary heater; the coolant temperature continues to increase (less heat is emitted by the air conditioner heat exchangers than is generated by the auxiliary heater or e.g. with the engine running - refer to -E-).

G = All the coolant drawn in by the circulation pump - V55- flows back via the engine to the auxiliary heater; the coolant temperature decreases (more heat is emitted by the front air conditioner heat exchangers or the engine than is generated by the auxiliary heater and the engine - refer to -E-).

H = The coolant temperature drops below 65 °C.





Note

- ◆ Depending on the ambient temperature and the quantity of heat emitted by the air conditioner heat exchangers, the activation of the heater coolant shut-off valve - N279- may remain in the various operating statuses for a lengthy period.
- ◆ Activation of the heater coolant shut-off valve - N279- is also maintained if the engine is started with the auxiliary heater in operation.
- ◆ Different auxiliary heater versions; this vehicle is currently fitted with an auxiliary heater on which the heater coolant shut-off valve - N279- is almost always activated in auxiliary heating mode (when the engine is not running).
- ◆ There are different versions of the heater coolant shut-off valve - N279-. Ensure correct assignment ⇒ Electronic parts catalogue .
- ◆ At a coolant temperature of approx. 89 °C, the auxiliary heater switches from control mode to control interval. During the control interval, the heater coolant shut-off valve - N279- is not activated and the coolant flows in the large coolant circuit (via the engine).
- ◆ The display in the "Read measured values" function for activation of the heater coolant shut-off valve - N279- differs and depends on the vehicle version and the version of the auxiliary heater control unit - J364-. On this vehicle for example, currently a display of 100 % indicates that 100 % of the coolant is being delivered in the small circuit and that the heater coolant shut-off valve - N279- is being activated ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ Depending on the vehicle version, the engine installed, the coolant temperature and the setting on the air conditioner operating unit (Climatronic control unit - J255-), the heater coolant shut-off valve - N279- may also be activated by the auxiliary heater control unit - J364- with the auxiliary heater switched off. In this case, the activation is a response to a request from -J255- via the data bus ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

1.7 Rules for cleanliness when working on the auxiliary/supplementary heater and fuel system

- ◆ Thoroughly clean all joints and connections and the surrounding areas before disconnecting.
- ◆ Place parts that have been removed on a clean surface (use sheeting or paper, not fluffy cloths) and cover them over.
- ◆ Carefully cover or seal open components if repairs cannot be carried out immediately.
- ◆ Only install clean components:
 - Replacement parts should only be unpacked immediately prior to installation.
 - Do not use parts that have been stored without their packaging (e.g. in toolboxes).
- ◆ When fuel system is open:
 - Do not work with compressed air.
 - Do not move vehicle.

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- Do not start engine.
- Do not switch on auxiliary heater (also applies to switching on via "Basic setting" function of Guided Fault Finding) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- Further safety precautions ⇒ Rep. gr. 00 ; Safety precautions; Safety precautions when working on the fuel supply system

1.8 Overview of components for auxiliary heater in vehicle



Note

- ◆ *Fitting locations of various relays and fuses for auxiliary heater ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*
- ◆ *The Guided Fault Finding for the auxiliary heater must be performed using the ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- ◆ *The Guided Fault Finding for the auxiliary heater can only be started with the ignition switched on (the data bus diagnostic interface - J533- is only active when the ignition is on). After the auxiliary heater has switched to diagnosis mode, the Guided Fault Finding for the auxiliary heater can be continued even with the ignition switched off.*
- ◆ *On versions with auxiliary heater from part number 4H_XXX XXX onwards, you must ensure the correct coding for the corresponding vehicle (different functions are stored in the control unit depending on the type of vehicle coded) ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- ◆ *When renewing the auxiliary heater, interrogate the encoding and adaption of the auxiliary heater control unit - J364- via the "Replace control unit" function of the Guided Fault Finding routine before removing the component (auxiliary heater control unit - J364- is installed in heater) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- ◆ *If the auxiliary heater cannot be activated on a new vehicle or on a vehicle with a newly installed auxiliary heater (depending on the version of the auxiliary heater control unit - J364-), the component protection function may be active. If a large number of faults occurred simultaneously prior to initial commissioning, e.g. at the factory, this fault is no longer displayed although it is still active. If necessary, re-adapt the component protection function in the same way as for a newly installed auxiliary heater to cancel the component protection ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*

2 Safety precautions

⇒ "2.1 Safety precautions when working on the fuel system", page 21

⇒ "2.2 Safety precautions when working on vehicles with start/stop system", page 21

⇒ "2.3 Safety precautions when using testers and measuring instruments during a road test", page 22

⇒ "2.4 Safety precautions when working on the cooling system", page 22

⇒ "2.5 Safety precautions when working on vehicles with auxiliary/supplementary heater", page 22

2.1 Safety precautions when working on the fuel system



WARNING

When working on the open fuel system, observe the rules for cleanliness and the safety precautions ⇒ page 24 and ⇒ Rep. gr. 00 ; Safety precautions; Safety precautions when working on the fuel supply system .

2.2 Safety precautions when working on vehicles with start/stop system



WARNING

Risk of injury due to automatic engine start on vehicles with start/stop system.

- ◆ *On vehicles with activated start/stop system (indicated by a message in the instrument cluster), the engine may start automatically if it needs to.*
- ◆ *Therefore it is important to ensure that the start/stop system is deactivated when performing repairs (switch off ignition, if required switch on ignition again).*

2.3 Safety precautions when using testers and measuring instruments during a road test

If using testers and measuring instruments during a road test, please note the following:



WARNING

Accidents can be caused if the driver is distracted by test equipment, or if test equipment is not properly secured.

Injuries can also be caused if the passenger airbag is triggered in a collision.

- *The use of test equipment while driving causes distraction.*
- *There is an increased risk of injury if test equipment is not secured.*
- ◆ *Testers and measuring instruments should always be secured on the rear seat with a strap and should be operated by a second person sitting in the rear.*

2.4 Safety precautions when working on the cooling system

Note the following when working on the cooling system:



WARNING

Risk of scalding due to hot steam and hot coolant.

- ◆ *The cooling system is pressurised. When the engine is warm, the coolant temperature may be above 90 °C.*
- ◆ *To relieve pressure, cover coolant expansion tank cap with a cloth and open carefully.*



Caution

Risk of overheating if cap is not fitted properly.

- ◆ *You must feel and hear cap engage when closing it.*

Further safety precautions ⇒ Rep. gr. 00 ; Safety precautions; Safety precautions when working on the cooling system

2.5 Safety precautions when working on vehicles with auxiliary/supplementary heater

- ◆ The auxiliary heater should not be switched on in areas where there is a danger of fire or explosion. Switch off auxiliary heater by pressing "OFF" button on remote control or via Multi Media Interface (MMI) (control unit for front display and information control panel - J523-) ⇒ "Infotainment/MMI" Operating Manual .
- ◆ The auxiliary heater must not be switched on in closed spaces without exhaust gas extraction systems.

- ◆ Observe the relevant safety regulations when working on the fuel system ⇒ Rep. gr. 00 ; Safety precautions; Safety precautions when working on the fuel supply system .
- ◆ The engine must not be started if components of the fuel system (e.g. metering pump - V54- , fuel line, fuel gauge sender) are removed or opened.
- ◆ After completing the repair work on the auxiliary heater or fuel system, check the operation of the auxiliary heater.
- ◆ Before starting repair work on auxiliary heater:
 - Release pressure in the cooling system by opening the cap on the coolant expansion tank.
 - Interrupt power and fuel supply for auxiliary heater (e.g. by removing auxiliary heater fuse) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
 - If the auxiliary heater is to be renewed, interrogate the coding and adaption of the auxiliary heater control unit - J364- using the "Replace control unit" function of the Guided Fault Finding routine ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ After completing repair work on the auxiliary heater, perform Guided Fault Finding (check coding, interrogate event memory and perform basic setting and adaption) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ Avoid switching the auxiliary heater on repeatedly without intermediate heating operation (if the auxiliary heater is switched off repeatedly during the start sequence, fuel may accumulate in the combustion chamber and the auxiliary heater may generate additional smoke when the auxiliary heater is next switched on).

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3 Repair instructions

⇒ "3.1 Rules for cleanliness", page 24

⇒ "3.2 General notes", page 24

⇒ "3.3 General repair instructions", page 25

⇒ "3.4 Contact corrosion", page 25

⇒ "3.5 Checking heating output", page 26

⇒ "3.6 Routing and attaching pipes, hoses and wiring",
page 26

⇒ "3.7 Notes on general repairs", page 26

3.1 Rules for cleanliness

- ◆ Thoroughly clean all joints and connections and the surrounding areas before disconnecting.
- ◆ Immediately seal off open lines and connections with clean plugs, e.g. from engine bung set - VAS 6122-.
- ◆ Place removed parts on a clean surface and cover them. Use only lint-free cloths.
- ◆ Carefully cover or seal open components if repairs cannot be carried out immediately.
- ◆ Protect unplugged electrical connectors against dirt and moisture and make sure connections are dry when attaching.
- ◆ Only install clean components:
 - Replacement parts should only be unpacked immediately prior to installation.
 - Do not use parts that have been stored without their packaging (e.g. in toolboxes).
- ◆ When fuel system is open:
 - Do not work with compressed air.
 - Do not move vehicle.
 - Do not start engine.
 - Do not switch on auxiliary heater (also applies to switching on via "Basic setting" function of Guided Fault Finding) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

3.2 General notes

⇒ "3.2.1 General notes", page 24

⇒ "3.2.2 Notes for vehicles with start/stop system", page 24

3.2.1 General notes

- ◆ For the applicable current flow diagrams, refer to ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- ◆ A label in the engine compartment provides information on the auxiliary/supplementary heater ⇒ [page 1](#).

3.2.2 Notes for vehicles with start/stop system

- ◆ On vehicles with a start/stop system, the circulation pump - V55- of the auxiliary heater is activated by the auxiliary heater control unit - J364- while the stop function is active. The auxiliary heater control unit - J364- is requested to switch on the circulation pump - J255- via the data bus by the air conditioner

operating unit (Climatronic control unit - V55-) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

3.3 General repair instructions

- ◆ Disconnect battery before starting electric welding work on vehicle ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
- ◆ If coolant has been drained, bleed auxiliary heater after filling cooling system ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system and ⇒ [page 81](#) .
- ◆ If parts of the fuel system have been removed or renewed, make sure that all components used for the fuel take-off to the auxiliary heater are properly installed. The auxiliary heater must then be switched on and operated at full load for at least 10 minutes to make sure that the fuel line is bled completely; the auxiliary heater must be checked for correct operation.
- ◆ After performing repairs in the vicinity of the fuel line to the auxiliary heater, check that:
 - There is no air in the fuel line to the auxiliary heater.
 - The fuel lines are flush with the underbody and protected against mechanical damage.
 - The fuel line to the auxiliary heater is protected against heat which could affect its operation.
 - The fuel line does not make contact with components which can become hot.
- ◆ When performing repair work in the area of the fuel delivery unit, make sure that the fuel take-off pipe for the auxiliary heater is routed correctly in the fuel tank.
- ◆ If the take-off pipe is not routed correctly, the metering pump - V54- may only supply fuel if the fuel tank is completely full; if this is not the case, no fuel is supplied and the auxiliary heater is deactivated due to a fault ⇒ [page 85](#) .
- ◆ After components of the fuel system have been removed and installed, the auxiliary heater must be switched on and operated at full load for at least 10 minutes to make sure that the fuel line is bled completely.
- ◆ If there is not enough fuel in the fuel tank (fuel gauge in dash panel insert is in "red zone"), the auxiliary heater control unit - J364- does not switch on the auxiliary heater (activation prohibited via the data bus due to a lack of fuel).
- ◆ Prior to activation and during operation of the auxiliary heater, the auxiliary heater control unit - J364- interrogates the data bus diagnostic interface - J533- / battery monitor control unit - J367- via the data bus. As soon as the data bus diagnostic interface - J533- transmits a request for energy saving because the battery is no longer sufficiently charged or because the voltage of the electrical system is insufficient, the auxiliary heater control unit - J364- switches off the auxiliary heater.

3.4 Contact corrosion

Contact corrosion can occur if unsuitable connecting elements (bolts, nuts, washers), rivets, plugs, grommets, adhesives, etc. are used.

For this reason, the manufacturer only fits connecting elements with a special coating. In addition, rubber components, plastic components and adhesives are made of non-conductive materials. These tested, aluminium-compatible components are also available as replacement parts ⇒ Electronic parts catalogue .

Please note:

- ◆ If you have any doubts about whether certain parts can be re-used, always use new components.
- ◆ We recommend the use of genuine replacement parts only as these have been checked and are compatible with aluminium
⇒ Electronic parts catalogue .
- ◆ We recommend using Audi Accessories ⇒ Electronic parts catalogue .
- ◆ Damage caused by contact corrosion is not covered by the warranty.

3.5 Checking heating output

- ◆ Checking operation and heating output of auxiliary heater
⇒ Vehicle diagnostic tester ("Guided Fault Finding")
- ◆ Checking heating output of air conditioner ⇒ Heating, air conditioning; Rep. gr. 87 ; Heater and air conditioning unit (front); Checking heating output and activation of temperature flaps for air conditioner .

3.6 Routing and attaching pipes, hoses and wiring

- ◆ To avoid interchanging components and to make sure the components are re-installed in the original positions, mark e.g. fuel lines, hydraulic fluid lines, vacuum lines, activated charcoal filter system lines and electrical wiring before removing them. Make sketches or take photographs if necessary.
- ◆ To avoid damaging pipes, hoses and wiring, ensure sufficient clearance from all moving or hot components in engine compartment (limited space in engine compartment).
- ◆ After attaching, check routing of refrigerant lines. They must be inserted in brackets provided and should not make contact with other components.

3.7 Notes on general repairs

- ◆ Self-diagnosis for auxiliary heater ⇒ Vehicle diagnostic tester ("Guided Fault Finding")
- ◆ If parts of the fuel system have been removed or renewed, make sure that all components used for the fuel take-off to the auxiliary heater are properly installed.
- ◆ Before removing the coolant hoses, mark them to avoid interchanging them.
- ◆ After performing repairs in the vicinity of the fuel line to the auxiliary heater, check that:
 - The fuel lines are flush with the underbody and protected against mechanical damage.
 - The fuel line to the auxiliary heater is protected against heat which could affect its operation.
 - The fuel line does not make contact with components which can become hot.

82 – Auxiliary heating

1 Overview of fitting locations - auxiliary/supplementary heater

⇒ “1.1 Overview of fitting locations - components not located in passenger compartment”, page 27

⇒ “1.2 Overview of fitting locations - components in passenger compartment (front)”, page 31

1.1 Overview of fitting locations - components not located in passenger compartment

1 - Metering pump - V54-

- Removing and installing ⇒ [page 94](#)
- Fuel take-off for auxiliary heater ⇒ [page 85](#)
- Checking fuel delivery rate ⇒ [page 90](#)
- Checking activation and wiring ⇒ Vehicle diagnostic tester (“Guided Fault Finding”)
- Some vehicle versions are fitted with noise insulation in the fuel line to the auxiliary heater in the vicinity of the metering pump - V54- to reduce noise

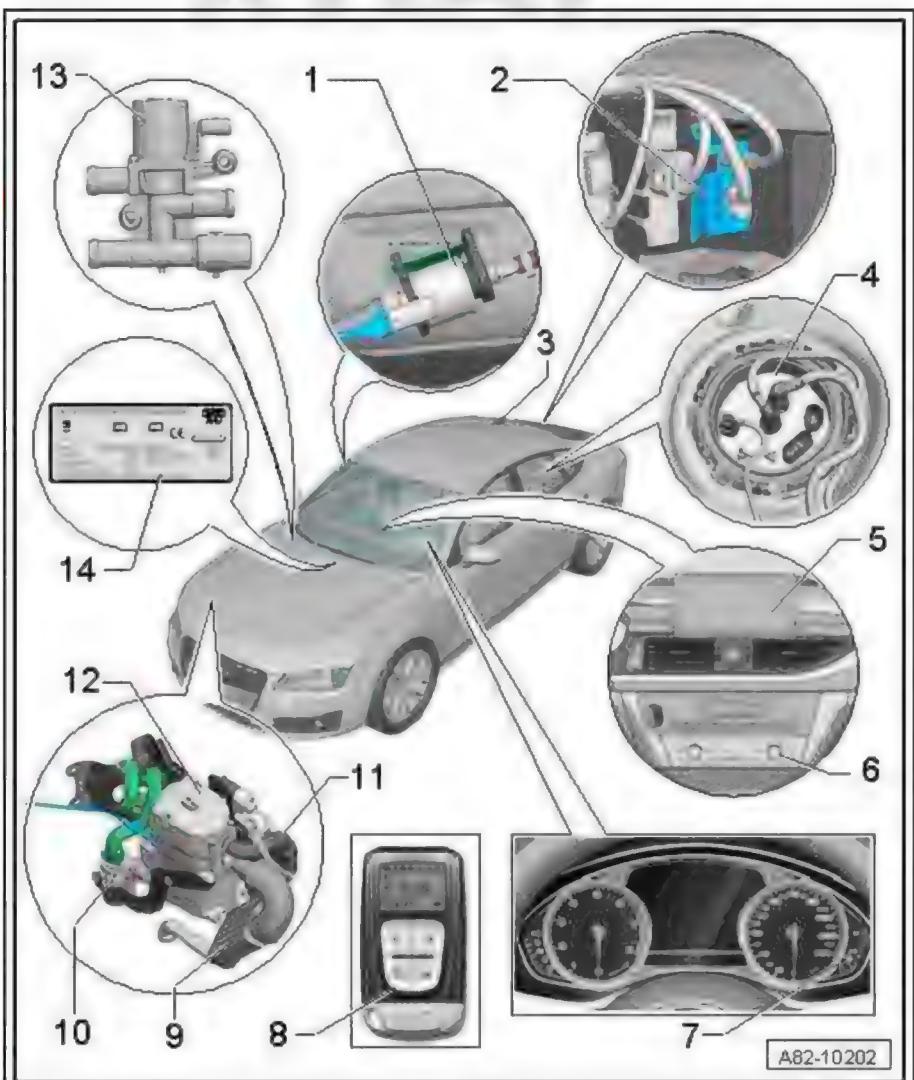
2 - Remote control receiver for auxiliary heater - R64-

3 - Roof aerial - R216-

- Receives radio signals from remote control units
- Relays radio signals to remote control receiver for auxiliary heater - R64- via aerial wire
- Transmits feedback on function data to hand-held transmitter for remote control
⇒ [Item 8 \(page 35\)](#)

4 - Fuel delivery unit with connection for fuel take-off for auxiliary heater

- Different versions ⇒ Electronic parts catalogue
- Fuel take-off for auxiliary heater ⇒ [page 85](#)



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Note

After components of the fuel system have been removed and installed, the auxiliary heater must be switched on and operated at full load for at least 10 minutes to make sure that the fuel line is bled completely.

5 - Multi Media Interface (MMI, control unit for front display and information control panel - J523-)

6 - Air conditioner operating unit (Climatronic control unit - J255-)

7 - Dash panel insert

8 - Remote control for auxiliary heater

9 - Exhaust silencer of auxiliary heater

- Removing and installing [⇒ page 63](#)



Note

If there is an arrow on the exhaust silencer, this can be disregarded as it does not show the direction of flow and is not relevant to the function.

10 - Circulation pump - V55-

- Activated by the auxiliary heater control unit - J364- ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- Removing and installing [⇒ page 60](#)
- Depending on vehicle equipment, the auxiliary heater control unit - J364- may activate the circulation pump - V55- even when the auxiliary heater is switched off due to a request received via the data bus, e.g. from the engine control unit or air conditioner operating unit (Climatronic control unit - J255-).



Note

On vehicles with a start/stop system, the circulation pump - V55- of the auxiliary heater is activated by the auxiliary heater control unit - J364- while the stop function is active. The auxiliary heater control unit - J364- is requested to switch on the circulation pump - J255- via the data bus by the air conditioner operating unit (Climatronic control unit - V55-) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



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11 - Intake air noise insulation

- Removing and installing [⇒ page 59](#)

12 - Auxiliary heater

- Different versions ⇒ Electronic parts catalogue
- Removing and installing [⇒ page 45](#)
- Incorporation into coolant circuit [⇒ page 76](#)
- Dismantling and assembling [⇒ page 50](#)
- Checking electrical components of auxiliary heater ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and [⇒ page 70](#)
- Overview of wiring and activation of auxiliary heater [⇒ page 69](#)



Note

- ◆ This auxiliary heater is fitted in various vehicle models. The part number may change with each new vehicle model in which this auxiliary heater is installed. It is therefore important to observe the correct assignment. An old auxiliary heater version must never be installed in a vehicle that was previously fitted with a newer version ⇒ *Electronic parts catalogue*.
- ◆ With this version (from part number -4H_xxx xxx- onwards), you must also make sure that it is correctly coded for the corresponding vehicle (different functions are stored in the control unit depending on the type of vehicle coded) ⇒ *Vehicle diagnostic tester ("Guided Fault Finding")*.
- ◆ Various functions of the auxiliary heater and air conditioner are adjusted on the Multi Media Interface (MMI) ⇒ [page 2](#). In the event of problems with auxiliary heater control or heating output, you should therefore check these settings on the MMI ⇒ *Owner's Manual* and ⇒ *"Infotainment/MMI" Operating Manual*.
- ◆ A start/stop system is available as an optional extra for certain engines. On these versions, ensure that the correct versions of the air conditioner operating unit (Climatronic control unit - J255-) and auxiliary heater are used ⇒ *Electronic parts catalogue* and ⇒ *Vehicle diagnostic tester ("Guided Fault Finding")*.
- ◆ On vehicles with a start/stop system, the circulation pump - V55- of the auxiliary heater is activated by the auxiliary heater control unit - J364- while the stop function is active. The auxiliary heater control unit - J364- is requested to switch on the circulation pump - J255- via the data bus by the air conditioner operating unit (Climatronic control unit - V55-) ⇒ *Vehicle diagnostic tester ("Guided Fault Finding")*.
- ◆ If the auxiliary heater or the auxiliary heater control unit - J364- is renewed, check the operation of at least one hand-held transmitter for remote control and re-adapt all hand-held transmitters if necessary ⇒ [page 119](#) and ⇒ *Vehicle diagnostic tester ("Guided Fault Finding")*.



- ◆ *Checking power supply for auxiliary heater ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and [page 70](#).*
- ◆ *If the entry "Wrong control unit fitted" is displayed after renewing the auxiliary heater or the auxiliary heater control unit - J364-, check that the auxiliary heater control unit - J364- has been coded for the correct type of fuel (diesel or petrol) and correct if necessary ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*
- ◆ *Depending on the mode ("Auxiliary heating" or "Auxiliary ventilation"), certain faults which impair the auxiliary heating/auxiliary ventilation are not stored in the event memory of the auxiliary heater control unit - J364-. Therefore, if there is a problem with the auxiliary heater, also read out the event memory of the air conditioner operating unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*

The auxiliary heater is fitted with the following electrical components:

- ◆ Auxiliary heater control unit - J364-
- ◆ Temperature sensor - G18-
- ◆ Flame monitor - G64-
- ◆ Temperature sensor 2 for supplementary and auxiliary heating - G587-
- ◆ Glow plug for heater - Q9-
- ◆ Combustion air blower - V6-
- ◆ Fuel pre-heating heater element - Z66-

13 - Heater coolant shut-off valve - N279-

- Assumes the function of the coolant shut-off valve - N82- on vehicles with auxiliary heater
- Activated by auxiliary heater control unit - J364-
- Different versions ⇒ Electronic parts catalogue
- Removing and installing [page 78](#)
- Checking wiring ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and [page 70](#)
- Operation [page 16](#)

14 - Factory label duplicate for auxiliary heater

- Indicates both technical data and auxiliary heater version.
- Bonded onto inside of bonnet

1.2 Overview of fitting locations - components in passenger compartment (front)

- 1 - Metering pump - V54-
- 2 - Remote control receiver for auxiliary heater - R64-

Overview [⇒ page 104](#)



Note

There are different versions of the hand-held transmitter for the control and the remote receiver for auxiliary heat. Make sure that these components are combined correctly with each other and with the air conditioning unit (Climatronic - J255-). There might be malfunctions if the wrong components are installed together ⇒ page 104.

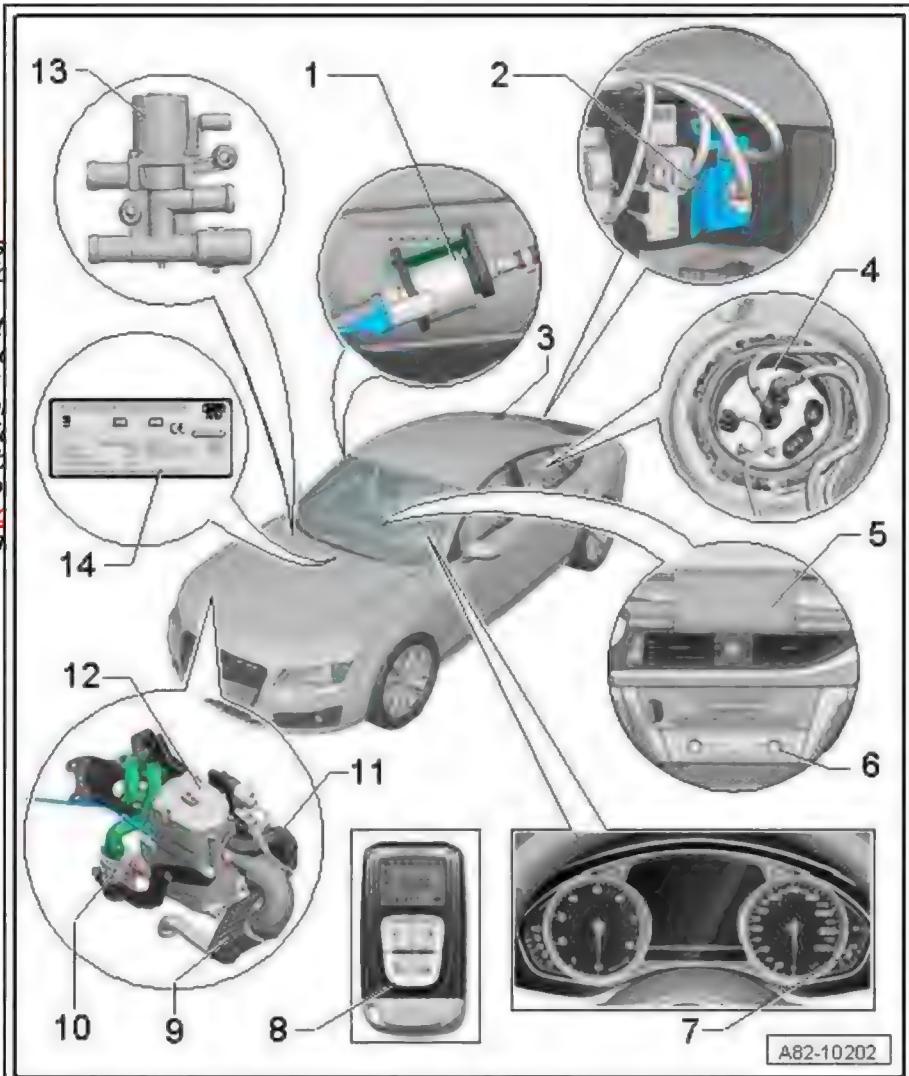
⇒ Electronic parts catalog

- 3 - Roof aerial - R216-

- 4 - Fuel delivery unit with connection for fuel take-off for auxiliary heater

- 5 - Multi Media Interface (MMI), control unit for front display and information control panel - J523-)

The various functions for activating the auxiliary heater and auxiliary ventilation are entered via the Multi Media Interface (MMI, control unit for front display and information control panel - J523-) and indicated in the corresponding display [⇒ page 107](#).



A82-10202



Note

Various functions of the auxiliary heater are adjusted on the Multi Media Interface (MMI). In the event of problems with auxiliary heater control or heating output, you should therefore check these settings on the MMI ⇒ Owner's Manual and ⇒ "Infotainment/MMI" Operating Manual.

- Operation of auxiliary heater (in "Car" menu of Multi Media Interface (MMI), control unit for front display and information control panel - J523-) and corresponding displays are described in the corresponding manual ⇒ Infotainment/MMI Operating Manual .
- If there is not enough fuel in the fuel tank (fuel gauge in red zone), the auxiliary heater cannot be switched on (tick in Multi Media Interface (MMI, control unit for front display and information control panel - J523-) for "Immediate auxiliary heater activation" function and symbol for auxiliary heating mode in clock cannot be activated or disappears again) ⇒ Owner's Manual and ⇒ Infotainment/MMI Operating Manual .



Note

- ◆ *The display of the additional auxiliary heater and air conditioner functions depends on the encoding of the air conditioner operating unit (Climatronic control unit - J255-). If the assignment and coding are incorrect, the various functions of the auxiliary heater and air conditioner cannot be displayed or selected in the Multi Media Interface (MMI, control unit for front display and information control panel - J523-) ⇒ Vehicle diagnostic tester ("Guided Fault Finding"), ⇒ Owner's Manual and ⇒ Infotainment/MMI Operating Manual .*
- ◆ *Depending on the version of the control units involved and the encoding of the air conditioner operating unit (Climatronic control unit - J255-), the additional functions of the auxiliary heater and air conditioner are selected and activated using rotary control of the air conditioner operating unit (Climatronic control unit - J255-) or on the operating unit of the Multi Media Interface (MMI) (control unit for front display and information control panel - J523-) ⇒ **page 2** , ⇒ Owner's Manual and ⇒ "Infotainment/ MMI" Operating Manual .*
- ◆ *Depending on vehicle version, equipment, production period and the setting in the Multi Media Interface (MMI), certain auxiliary heater functions can also be switched on and off via the programmable steering wheel button ⇒ Owner's Manual and ⇒ Infotainment/MMI Operating Manual .*



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- ◆ Ensure correct assignment and coding of the air conditioner operating unit (Climatronic control unit - J255-), e.g. to control unit for front display and information control panel - J523- , to control unit 1 for information electronics - J794- and to remote control receiver for auxiliary heater - R64-
⇒ *Electronic parts catalogue* (different versions). In the event of incorrect assignment, the various auxiliary heater and air conditioner functions cannot be displayed and selected in the Multi Media Interface (MMI, control unit for front display and information control panel - J523-) or by the hand-held transmitter for remote control
⇒ "[6.3.5 Remote control for auxiliary heater](#)", page 115 and
⇒ "[1.4 Notes on auxiliary/supplementary heater](#)", page 2 .

6 - Air conditioner operating unit (Climatronic control unit - J255-)

- Activated via the data bus
- Various functions of the auxiliary heater and air conditioner are adjusted on the Multi Media Interface (MMI). In the event of problems with auxiliary heater control or heating output, you should therefore check these settings on the MMI ⇒ Owner's Manual and ⇒ "Infotainment/MMI" Operating Manual .
- When operating the auxiliary heater via the "Timer" function or the remote control, this component determines the mode in which the auxiliary heater starts up (auxiliary ventilation or auxiliary heating)
⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- For the auxiliary heater to be activated via the "Timer" function or the remote control (hand-held transmitter), a temperature greater than "Lo" must have been set on the air conditioner operating unit (Climatronic control unit - J255-).
- To de-ice the windows as quickly as possible, it is recommended to set the maximum temperature on the air conditioner operating unit (Climatronic control unit - J255-) before switching off the ignition. The air conditioner operating unit (Climatronic control unit - J255-) adopts the most recent temperature setting in auxiliary heating mode and regulates passenger compartment temperature in line with the specified temperature setting.
- The "Auxiliary heating" optional extra is currently only available for the "deluxe" version of the air conditioner.



Note

- ◆ A start/stop system is offered as an optional extra for this vehicle in combination with certain engines. On these versions, ensure that the correct versions of the air conditioner operating unit (Climatronic control unit - J255-) and auxiliary heater are used ⇒ *Electronic parts catalogue* and ⇒ *Vehicle diagnostic tester* ("Guided Fault Finding").



- ◆ On vehicles with a start/stop system, the circulation pump - V55- of the auxiliary heater is activated by the auxiliary heater control unit - J364- while the stop function is active. The auxiliary heater control unit - J364- is requested to switch on the circulation pump - J255- via the data bus by the air conditioner operating unit (Climatronic control unit - V55-)
⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ Depending on the mode ("Auxiliary heating" or "Auxiliary ventilation"), certain faults which impair the auxiliary heating/auxiliary ventilation are not stored in the event memory of the auxiliary heater control unit - J364-. Therefore, if there is a problem with the auxiliary heater, also read out the event memory of the air conditioner operating unit (Climatronic control unit - J255-)
⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ There are different versions of the hand-held transmitter for remote control and the remote control receiver for auxiliary heater - R64-; make sure that these components are combined correctly with each other and with the air conditioner operating unit (Climatronic control unit - J255-). There might be malfunctions if the wrong components are installed together
⇒ ["6.3.5 Remote control for auxiliary heater", page 115](#) and ⇒ [Electronic parts catalogue](#)
- ◆ Additional functions of the auxiliary heater may be controlled by the Climatronic control unit - J255- and control unit for front display and information control panel - J523-, depending on the control unit version and the vehicle production period (e.g. the auxiliary heater can be deactivated with the ignition switched on by briefly pressing the **OFF** button on the air conditioner operating unit - J255-). For further information, refer to ⇒ [Owner's Manual](#) and ⇒ [Infotainment/MMI Operating Manual](#).

7 - Dash panel insert

- Depending on the version, the "auxiliary heater" (optional extra) must have been adapted via the "Adaption" function in the control unit in dash panel insert - J285- ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- If there is not enough fuel in the fuel tank (fuel gauge in red zone), the auxiliary heater cannot be switched on (tick in Multi Media Interface (MMI, control unit for front display and information control panel - J523-) for "Immediate auxiliary heater activation" function and symbol for auxiliary heating mode in control unit

-J255- cannot be activated or disappear again) ⇒ Vehicle diagnostic tester ("Guided Fault Finding"), ⇒ Owner's Manual and ⇒ Infotainment/MMI Operating Manual .

- Depending on the operating status of the auxiliary heater (heating/auxiliary ventilation mode) or on whether the timer function has been selected, one of the symbols in the display of -J255- for auxiliary heating/auxiliary ventilation is activated permanently, or one of the symbols flashes ⇒ Owner's Manual and ⇒ Operating Manual .
- If the vehicle is fitted with a remote control for the auxiliary heater (currently always provided), this activates the auxiliary heater control unit - J364- . The control unit then transmits the information "Activate or deactivate auxiliary heating/auxiliary ventilation" via the data bus to the air conditioner operating unit, Climatronic control unit - J255- . The air conditioner operating unit (Climatronic control unit - J255-) then determines whether auxiliary heating mode is required to attain the specified temperature or whether auxiliary ventilation mode is sufficient.



Note

If the auxiliary heater is activated via the "Timer" function or the remote control and the temperature setting on -J255- is "Lo", the auxiliary heater only starts up if the ambient temperature is below e.g. 10 °C at the time. If the ambient temperature in this setting is above approx. 10 °C, only auxiliary ventilation mode is activated ⇒ Vehicle diagnostic tester ("Guided Fault Finding"), ⇒ Owner's Manual and ⇒ Infotainment/MMI Operating Manual .

8 - Remote control for auxiliary heater

- For switching the "auxiliary heating" or "auxiliary ventilation" function of the auxiliary heater on and off ⇒ [page 115](#)
- After the battery is removed, the version of the remote control can be seen on the sticker with the part number ⇒ [page 115](#) ⇒ Electronic parts catalogue .
- Renewing battery in remote control ⇒ [page 118](#)
- Pay attention to correct assignment (different versions)
⇒ ["6.3.5 Remote control for auxiliary heater", page 115](#) ⇒ Electronic parts catalogue .
- Adapting remote control ⇒ [page 119](#)
- If the auxiliary heater is renewed together with the auxiliary heater control unit - J364- , check the operation of at least one remote control and re-adapt all remote controls if necessary ⇒ [page 119](#) and ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- Indication of fault status (e.g. "heating not possible") on display of remote control ⇒ [page 117](#)



Note

♦ *Depending on the mode ("Auxiliary heating" or "Auxiliary ventilation"), certain faults which impair the auxiliary heating/auxiliary ventilation are not stored in the event memory of the auxiliary heater control unit - J364- . Therefore, if there is a problem with the auxiliary heater, also read out the event memory of the air conditioner operating unit (Climatronic control unit - J255-) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").*



- ◆ There are different versions of the hand-held transmitter for remote control and the remote control receiver for auxiliary heater - R64- ; make sure that these components are combined correctly with each other and with the air conditioner operating unit (Climatronic control unit - J255-). There might be malfunctions if the wrong components are installed together
⇒ **"6.3.5 Remote control for auxiliary heater", page 115** and ⇒ **Electronic parts catalogue**

9 - Exhaust silencer of auxiliary heater



Note

If there is an arrow on the exhaust silencer, this can be disregarded as it does not show the direction of flow and is not relevant to the function.

10 - Circulation pump - V55-

11 - Intake air noise insulation

12 - Auxiliary heater

13 - Heater coolant shut-off valve - N279-

14 - Factory label duplicate for auxiliary heater



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2 Auxiliary/supplementary heater

- ⇒ "2.1 Overview of fitting locations - auxiliary/supplementary heater", page 37
- ⇒ "2.2 Exploded view - components inside auxiliary/supplementary heater", page 41
- ⇒ "2.3 Removing and installing auxiliary/supplementary heater", page 45
- ⇒ "2.4 Dismantling and assembling auxiliary/supplementary heater", page 50
- ⇒ "2.5 Removing and installing air intake silencer", page 59
- ⇒ "2.6 Removing and installing circulation pump V55", page 60
- ⇒ "2.7 Removing and installing exhaust system", page 63
- ⇒ "2.8 Removing and installing bracket for auxiliary/supplementary heater", page 64
- ⇒ "2.9 Removing and installing flame monitor G64", page 64
- ⇒ "2.10 Removing and installing temperature sensor G18", page 65
- ⇒ "2.11 Removing and installing temperature sensor 2 for supplementary and auxiliary heating G587", page 67
- ⇒ "2.12 Pin assignment for auxiliary/supplementary heater", page 69
- ⇒ "2.13 Checking electrical components on auxiliary/supplementary heater", page 70

2.1 Overview of fitting locations - auxiliary/supplementary heater



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from the use of parts or components not supplied by the original equipment manufacturer or supplier.

1 - Electrical connector

- 2-pin [⇒ page 69](#)
- Pin assignment
[⇒ page 69](#) and [⇒ Current flow diagrams, Electrical fault finding and Fitting locations](#)

2 - Electrical connector

- 6-pin [⇒ page 69](#)
- Pin assignment
[⇒ page 69](#) and [⇒ Current flow diagrams, Electrical fault finding and Fitting locations](#)

3 - Clips (2x)

- For securing electrical connector

4 - Wiring clip

- For securing wires at bracket

5 - Bolt (3x)

- Tightening torque: 6 Nm
- Securing bracket to auxiliary heater
[⇒ page 64](#)

6 - Bracket for auxiliary heater

- Securing auxiliary heater [⇒ page 64](#)

7 - Bolt

- Tightening torque: 6 Nm
- Securing exhaust silencer [⇒ page 63](#)

8 - Cable tie

- Secures intake air noise insulation to bracket for auxiliary heater

9 - Rubber element (3x)

- Secures bracket to auxiliary heater
- Noise reduction

10 - Bush (3x)

- Secures bracket to auxiliary heater with rubber element

11 - Hose clip

- Secures intake air noise insulation to air intake connection of auxiliary heater
- Removing and installing [⇒ page 59](#)

12 - Cable tie

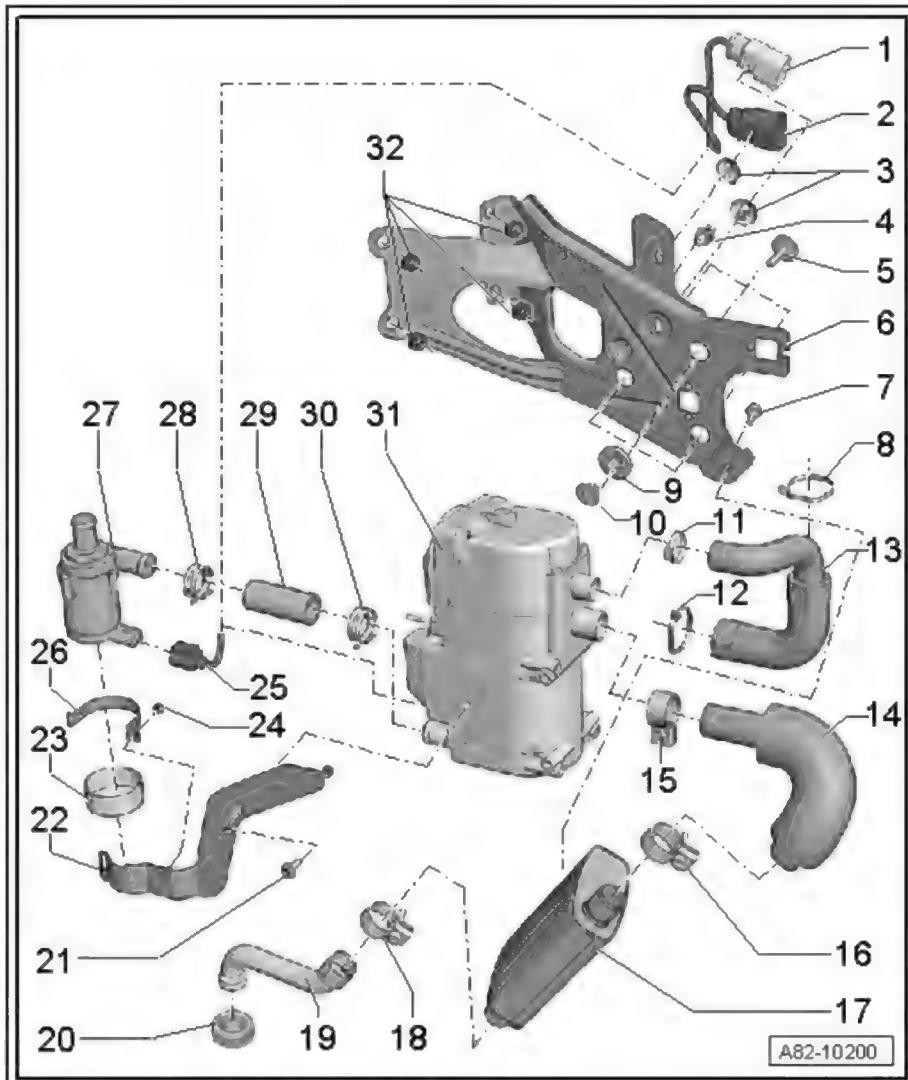
- Secures intake air noise insulation to bracket for auxiliary heater

13 - Intake air noise insulation

- Removing and installing [⇒ page 59](#)

14 - Exhaust pipe

- With thermal insulation to protect surrounding **components**
- Removing and installing exhaust system [⇒ page 63](#)



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Note

- ◆ *The flow of exhaust gas out of the exhaust pipe must not be obstructed.*
- ◆ *After working on the auxiliary heater, check the end of the exhaust pipe; it must be installed so it is at a right angle to the noise insulation at the point where it passes through the noise insulation [⇒ page 63](#).*

15 - Hose clip

- Tightening torque of bolt: 6 Nm
- Secures exhaust pipe to auxiliary heater
- Removing and installing exhaust system [⇒ page 63](#)

16 - Hose clip

- Tightening torque of bolt: 6 Nm
- Secures exhaust pipe to exhaust silencer
- Removing and installing exhaust system [⇒ page 63](#)

17 - Exhaust silencer

- Removing and installing [⇒ page 63](#)



Note

If there is an arrow on the exhaust silencer, this can be disregarded as it does not show the direction of flow and is not relevant to the function.



18 - Hose clip

- Tightening torque of bolt: 6 Nm
- Secures exhaust pipe to exhaust silencer
- Removing and installing exhaust system [⇒ page 63](#)

19 - Exhaust pipe

- Removing and installing exhaust system [⇒ page 63](#)

20 - Rubber grommet

- For fixing position of exhaust pipe in noise insulation [⇒ page 63](#)
- Removing and installing exhaust system [⇒ page 63](#)
- Different versions [⇒ page 63](#) and ⇒ Electronic parts catalogue

21 - Bolt

- Tightening torque: 6 Nm
- Secures bracket for circulation pump - V55-
- Removing and installing circulation pump - V55- [⇒ page 60](#)

22 - Bracket

- Secures circulation pump - V55-
- Removing and installing circulation pump - V55- [⇒ page 60](#)

23 - Rubber ring

- Secures circulation pump - V55-

24 - Nut

- Tightening torque: 3.5 Nm
- Secures circulation pump - V55-

- Removing and installing circulation pump - V55- [⇒ page 60](#)

25 - Electrical connector

- Power supply for circulation pump - V55- [⇒ page 69](#)
- Removing and installing circulation pump - V55- [⇒ page 60](#)

26 - Retaining bracket

- Secures circulation pump - V55-
- Removing and installing circulation pump - V55- [⇒ page 60](#)

27 - Circulation pump - V55-

- Removing and installing [⇒ page 60](#)
- Incorporation into coolant circuit [⇒ page 76](#)

28 - Hose clip

29 - Coolant hose

- From auxiliary heater to circulation pump - V55-
- Removing and installing circulation pump - V55- [⇒ page 60](#)

30 - Hose clip

31 - Auxiliary heater

- Removing and installing [⇒ page 45](#)
- Different versions; ensure correct assignment. In addition, the versions depend on the production period and the type of fuel (certain functions are differently matched for vehicles with petrol and diesel engine) [⇒ page 2](#) and [⇒ Electronic parts catalogue](#).



Note

A start/stop system is offered as an optional extra for this vehicle in combination with certain engines. On these versions, ensure that the correct versions of the air conditioner operating unit (Climatronic control unit - J255-) and auxiliary heater are used [⇒ Electronic parts catalogue](#) and [⇒ Vehicle diagnostic tester \("Guided Fault Finding"\)](#).

32 - Nut (4x)

- Secures bracket to vehicle
- Tightening torque: 20 Nm



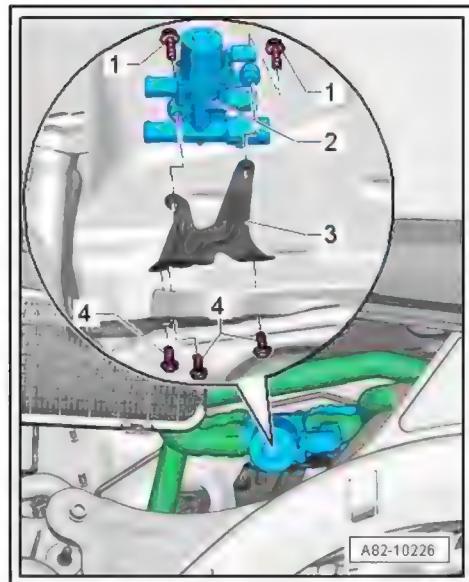
Heater coolant shut-off valve - N279- with bracket

- 1 - Bolt - 8 Nm
- 2 - Heater coolant shut-off valve - N279-
- 3 - Bracket
- 4 - Bolt - 6 Nm



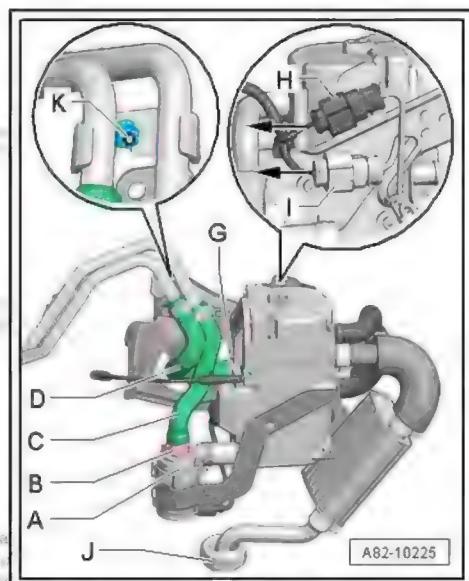
Note

The bracket -3- is secured in different ways. In this illustration, it is secured using bolts -4-. If secured with clip-on nuts, refer to ⇒ Heating, air conditioning; Rep. gr. 87 ; Coolant circuit; Overview of fitting locations - coolant circuit .



Bracket for coolant pipe

K - 8 Nm



2.2 Exploded view - components inside auxiliary/supplementary heater

1 - Bolt M5×80

- 4x
- Tightening torque: 6 Nm

2 - Cover for combustion air blower - V6-

- Air intake connection for auxiliary heater
[⇒ page 59](#)

3 - Bolt M4×16

- 4x
- Tightening torque: 3 Nm

4 - Cover for combustion air blower - V6-

5 - Combustion air blower - V6-

- Renewing [⇒ page 56](#)
- Do not dismantle any further
- Connection for auxiliary heater exhaust system
[⇒ page 63](#)

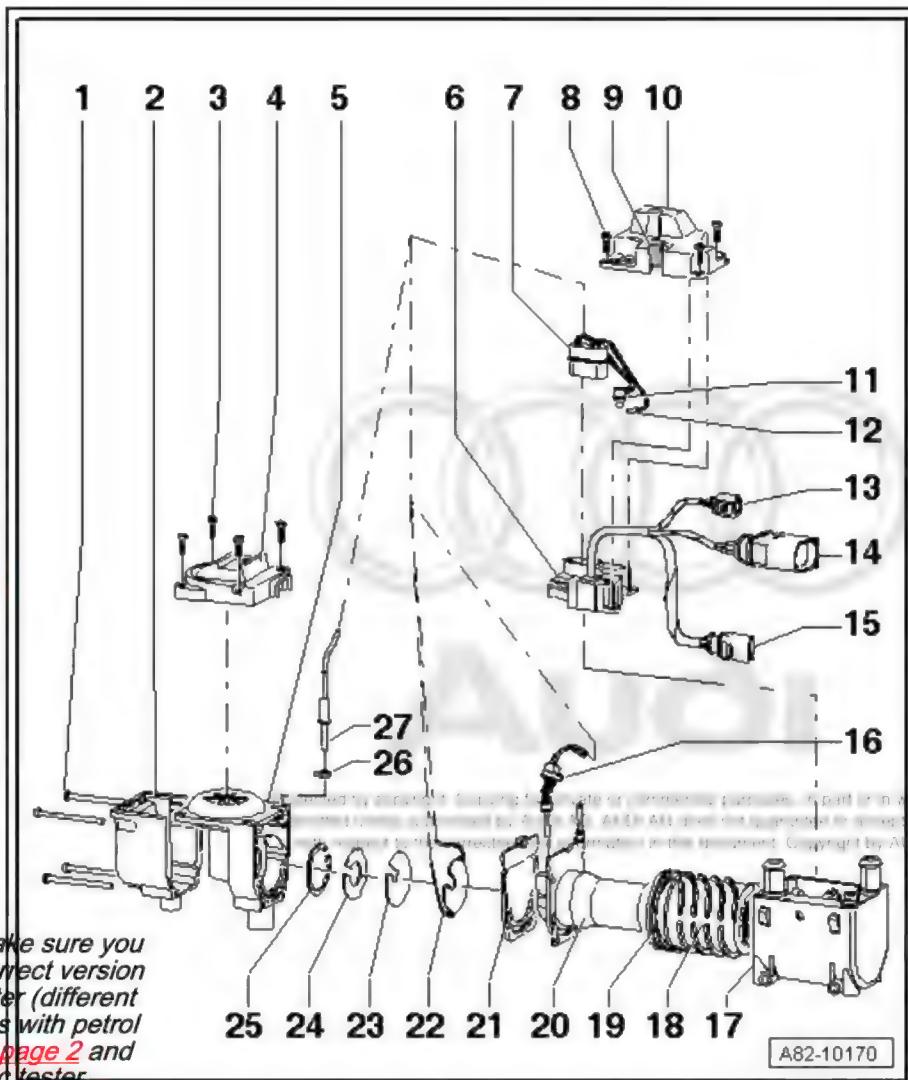
6 - Auxiliary heater control unit - J364-

- Removing and installing
[⇒ page 52](#)

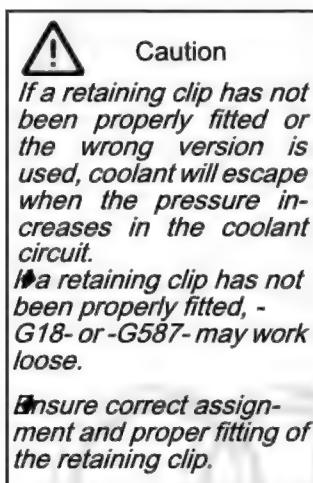


Note

- ◆ When renewing, make sure you are installing the correct version of the auxiliary heater (different versions for vehicles with petrol or diesel engine) [⇒ page 2](#) and [⇒ Vehicle diagnostic tester \("Guided Fault Finding"\)](#).
- ◆ This auxiliary heater is fitted in various vehicle models. The part number may change with each new vehicle model in which this auxiliary heater is installed. It is therefore important to observe the correct assignment. An old auxiliary heater version must never be installed in a vehicle that was previously fitted with a newer version [⇒ Electronic parts catalogue](#).
- ◆ Pay attention to correct coding for the vehicle concerned (different functions are stored in the control unit depending on the type of vehicle coded) [⇒ Vehicle diagnostic tester \("Guided Fault Finding"\)](#).



- ◆ There are different versions of the retaining clip for the temperature sensor - G18- ([⇒ Item 11 \(page 44\)](#)) and the temperature sensor 2 for supplementary and auxiliary heating - G587- ([⇒ Item 12 \(page 44\)](#)).
 -J364- with part number 4xx
xxx xxx must only be fitted with retaining clips with a spacer ring.
It is therefore important to observe the correct assignment (matching part numbers of retaining clip and auxiliary heater control unit - J364-)
⇒ page 65 and ⇒ Electronic parts catalogue .
- ◆ From 06.2011 onwards, modified auxiliary heaters have been in use (changes to auxiliary heater control unit - J364- , different glow plugs for heater - Q9- , different burner elements for diesel heaters and modified moulded gasket for petrol heaters). Check the correct version and allocation of these parts prior to installation ⇒ Electronic parts catalogue .



7 - 14-pin connector

- For connection to auxiliary heater control unit - J364-

Contact assignment and wiring colours:

- ◆ Temperature sensor - G18- : Contact 10 - black, contact 11 - black.
- ◆ Flame monitor - G64- : Contact 1 - brown, contact 2 - brown.
- ◆ Temperature sensor 2 for supplementary and auxiliary heating - G587- : Contact 7 - white, contact 8 - white.
- ◆ Glow plug for heater - Q9- : Contact 3 - brown, contact 6 - white.
- ◆ Combustion air blower V6-AU : Protected by copyright. All rights reserved. Any unauthorized use, distribution or copying of this document is illegal. Contact 13 - black, contact 14 - brown.
- ◆ Fuel pre-heating heater element - Z66- : Contact 9 - black, contact 12 - black.

8 - Bolt M4×16

- 4x
- Tightening torque: 3 Nm

9 - Clip

- For pipe leadthrough
- 10 - Cover for water jacket
 - Cover for auxiliary heater control unit - J364-



There are different versions of this cover. Make sure you are using the correct version (different versions for -J364- with part number 8xx xxx xxx and 4xx xxx xxx) ⇒ Electronic parts catalogue .

11 - Temperature sensor - G18-

- Removing and installing [⇒ page 65](#)
- Checking [⇒ page 73](#)

12 - Temperature sensor 2 for supplementary and auxiliary heating - G587-

- Removing and installing [⇒ page 67](#)
- Checking [⇒ page 74](#)

13 - 2-pin connector

- To circulation pump - V55-
- Pin assignment [⇒ page 69](#)

14 - 6-pin connector

- To auxiliary heater control unit - J364-
- Pin assignment [⇒ page 69](#)

15 - 2-pin connector

- Power supply
- Pin assignment [⇒ page 69](#)

16 - Glow plug for heater - Q9-

- Rated voltage: 8 volts
- Removing and installing [⇒ page 53](#)
- Checking [⇒ page 71](#)



There are different versions of the glow plug for heater - Q9-. Ensure correct assignment ⇒ Electronic parts catalogue .

17 - Water jacket

18 - Heat exchanger

- Removing and installing [⇒ page 58](#)
- Note installation position

19 - O-ring

- Renew
- Coat with small quantity of coolant when fitting

20 - Burner element

- If necessary, clean inside and outside with brass wire brush (spark plug brush)
- Removing and installing [⇒ page 57](#)
- Different versions (for petrol and diesel) ⇒ Electronic parts catalogue



Note

From 06.2011 onwards, modified auxiliary heaters have been in use (changes to auxiliary heater control unit - J364-, different glow plugs for heater - Q9-, different burner elements for diesel heaters and modified moulded gasket for petrol heaters). Check the correct version and allocation of these parts prior to installation ⇒ Electronic parts catalogue .

21 - Moulded gasket

- Renew



Note

From 06.2011 onwards, modified auxiliary heaters have been in use (changes to auxiliary heater control unit - J364-, different glow plugs for heater - Q9-, different burner elements for diesel heaters and modified moulded gasket for petrol heaters). Check the correct version and allocation of these parts prior to installation ⇒ Electronic parts catalogue .

22 - Fuel pre-heating heater element - Z66-

- Removing and installing ⇒ [page 55](#)
- Checking ⇒ [page 75](#)

23 - Gasket

- Renew

24 - Washer

25 - Circlip

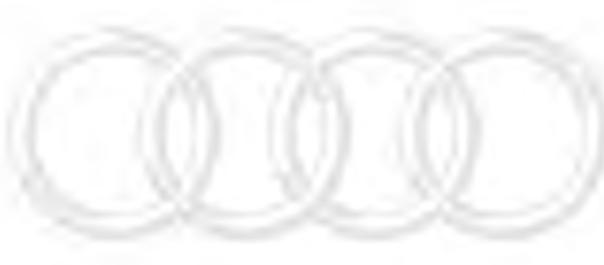
26 - Graphite seal

- Check and renew if damaged
- Note installation position



Note

The graphite seal is supplied together with the flame monitor - G64- ⇒ Electronic parts catalogue .



27 - Flame monitor - G64-

- Removing and installing ⇒ [page 64](#)
- Checking ⇒ [page 72](#)

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2.3 Removing and installing auxiliary/supplementary heater

Special tools and workshop equipment required

- ◆ Hose clamps up to Ø 25 mm - 3094-

- ◆ Hose clip pliers - VAS 6340-
- Call up "Replace control unit" function in Guided Fault Finding routine for auxiliary heater. The encoding and adaption of the auxiliary heater control unit - J364- are interrogated ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

Removing

- Switch off ignition (and auxiliary heater).



WARNING

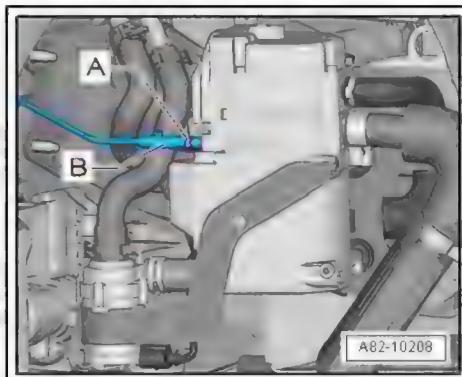
The cooling system is pressurised. When the engine is warm, the coolant temperature may be above 90 °C. Release pressure and wait for temperature to drop before performing repairs. Release pressure in coolant circuit by opening cap on coolant expansion tank ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

- Release pressure in coolant circuit by opening cap on coolant expansion tank.
- Remove front wheel (right-side) ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Remove wheel housing liner and wheel spoiler (front right) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner .
- Release hose clip -A-.
- Detach fuel line -B- from auxiliary heater and seal off.

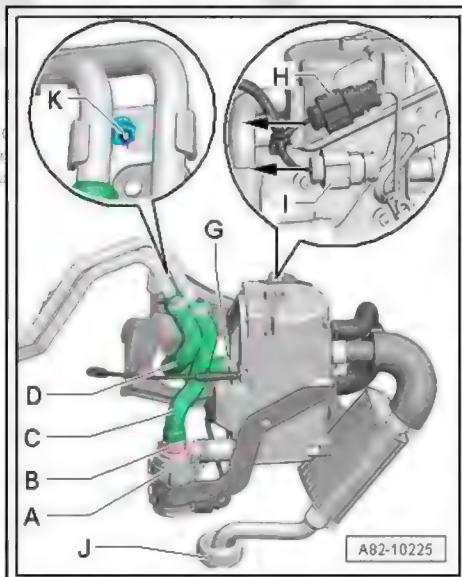


WARNING

When working on the open fuel system, observe the rules for cleanliness and the safety precautions ⇒ Rep. gr. 00 ; Safety precautions; Safety precautions when working on the fuel supply system .



- Remove nut at bracket for coolant pipes -K- and push bracket upwards slightly.
- Release 2-pin connector -H- and 6-pin connector -I- and unplug in direction of -arrows-.



- Unscrew nuts -M-.
- Clamp off coolant hoses -C- and -D-, e.g. with hose clamps up to Ø 25 mm - 3094- .
- Unfasten clamp -B- and detach coolant hose -C-.



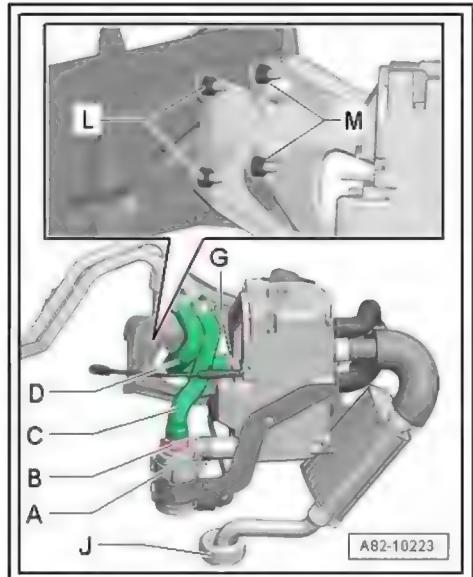
Note

*Make sure that only coolant can escape from the auxiliary heater and that the coolant circuit in the other components (engine, heat exchanger in air conditioning unit etc.) remains full, so that only the auxiliary heater has to be bled after installation
 ⇒ "3.3 Bleeding coolant circuit", page 81 .*

- Unscrew nuts -L- and swivel auxiliary heater with bracket to one side.
- Unfasten clamp -G- and detach coolant hose -D-.

Installing

Install auxiliary heater in reverse order of removal
 ⇒ "2.3 Removing and installing auxiliary/supplementary heater", page 45 .



Note

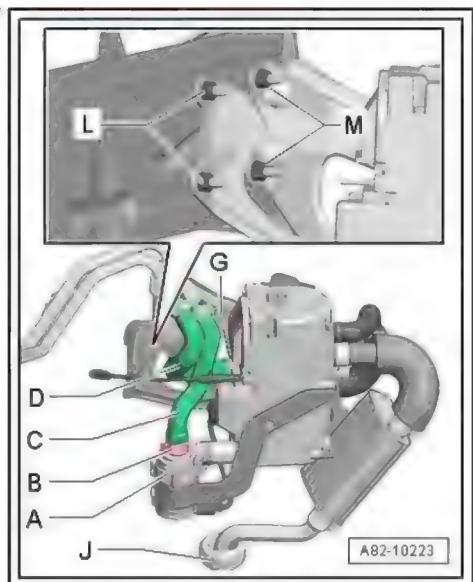
*Observe notes on auxiliary/supplementary heater
 ⇒ "1.4 Notes on auxiliary/supplementary heater", page 2 .*

- Fill coolant expansion tank with coolant as far as upper mark
 ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .
- Butt-joint coolant hose -D- at auxiliary heater and secure at marked locations with clamp -G- (using suitable pliers).
- Place auxiliary heater with bracket in installation position and screw on nuts -L- and -M-.
- Carefully release hose clamps up to Ø 25 mm - 3094- at coolant hose -D- and allow coolant to flow into auxiliary heater.
- As soon as coolant emerges from upper connection of circulation pump - V55- , attach coolant hose -C- to auxiliary heater and secure with clamp -B- (using suitable pliers).
- Detach both hose clamps up to 25 mm - 3094- .

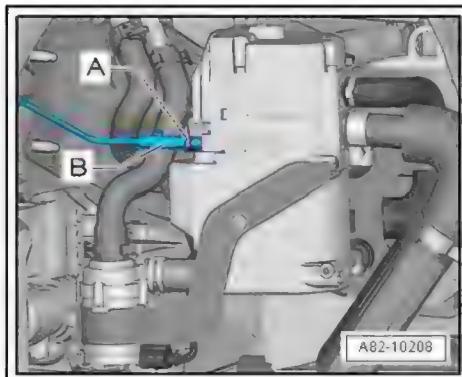


Note

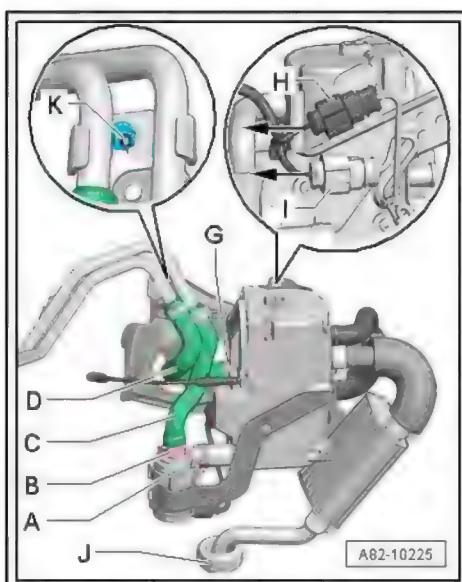
If the coolant circuit has been drained, the circulation pump - V55- must not be started up until the coolant circuit has been filled to prevent the pump from being damaged irreparably when it is run dry.



- Butt-joint fuel line -B- and secure it at marked locations with clamp of same type -A-.



- Place bracket for coolant pipes in installation position and tighten nut -K-.
- Plug in 2-pin connector -H- and 6-pin connector -I-; make sure they engage correctly.
- Bleed coolant circuit of auxiliary heater
⇒ "3.3 Bleeding coolant circuit", page 81 .
- Fill coolant expansion tank with coolant as far as upper mark
⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .



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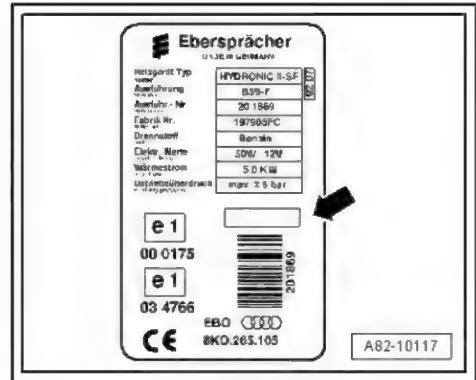
Note

- ◆ Following installation, check exhaust pipe, coolant hoses, fuel line and wiring to auxiliary heater (they must not make contact with other components).
- ◆ If the auxiliary heater is renewed, the factory label duplicate must be checked and renewed if necessary.
- ◆ If the auxiliary heater has been renewed, the year of initial commissioning for the newly installed heater must be entered on the heater type plate -arrow- and on the new "duplicate type plate" (illustration shows type plate for an auxiliary heater in a vehicle with petrol engine, as used at the start of production).
- ◆ There are different versions of factory labels.

- Check position of air intake and auxiliary heater exhaust system (air inlet and exhaust outlet must not be obstructed)
 ⇒ ["2.7 Removing and installing exhaust system", page 63](#).
- Continue with "Replace control unit" function in Guided Fault Finding routine for auxiliary heater. The auxiliary heater control unit - J364- is then coded and adaption performed ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- If necessary, release component protection function in same way as for a newly installed auxiliary heater to cancel auxiliary heater locking by component protection ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- Check operation of at least one hand-held transmitter. Re-adapt all hand-held transmitters if necessary (adapt hand-held transmitter for remote control) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- Start engine and interrogate event memory of all control units fitted. Faults may also have been entered for other control units via the data bus ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- After renewing auxiliary heater components, switch on auxiliary heater and allow it to run for at least 10 minutes at full load before the vehicle is returned to the customer. There may still be traces of factory lubricant (or similar) in the components which would evaporate following initial activation as soon as the components become hot.
- "Check CO₂ content of exhaust gas" ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and
 ⇒ ["4.6 Checking CO₂ content in auxiliary heater exhaust gas", page 98](#).

Tightening torques

- ◆ ⇒ ["2.1 Overview of fitting locations - auxiliary/supplementary heater", page 37](#)

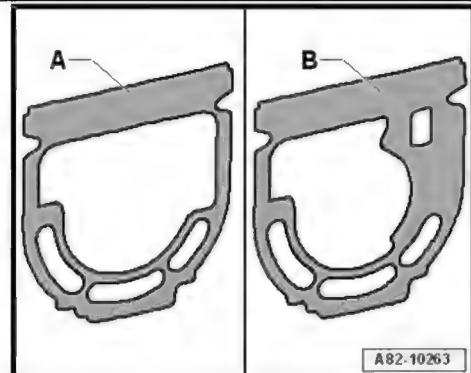
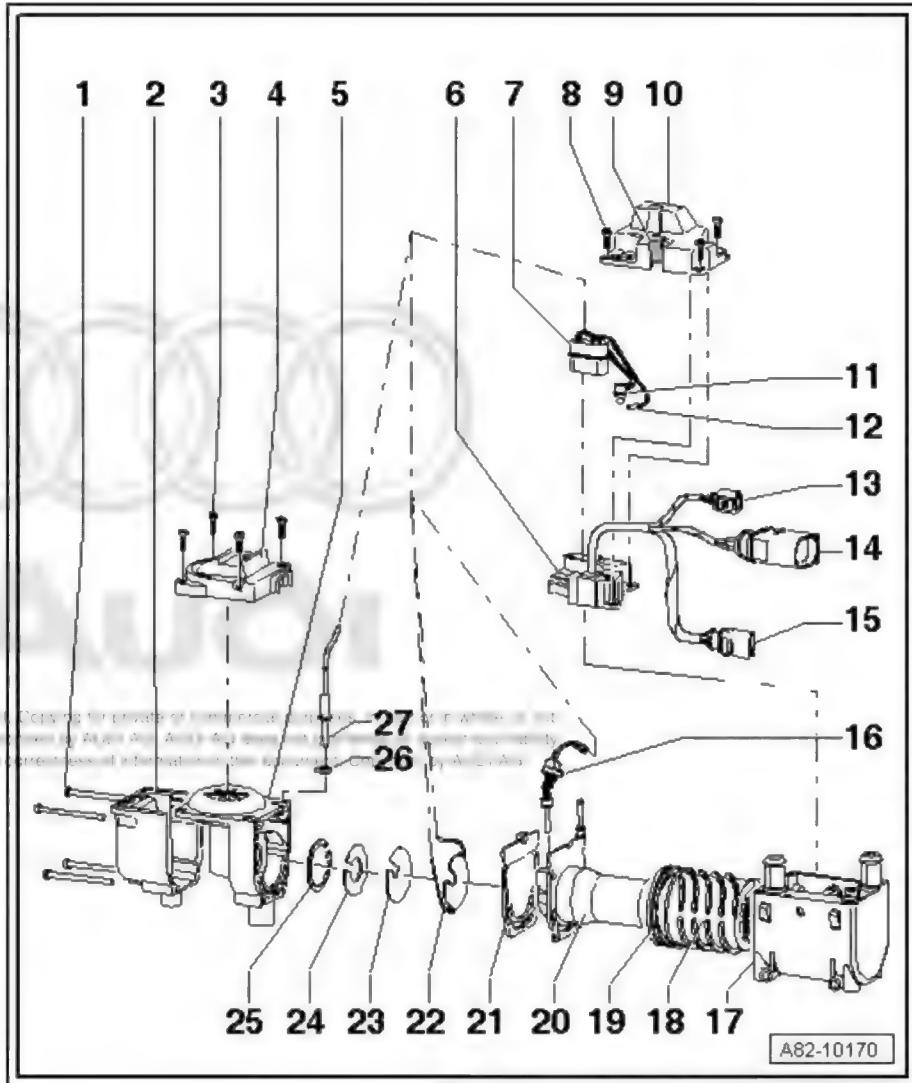




2.4 Dismantling and assembling auxiliary/supplementary heater

- ⇒ [“2.4.1 Dismantling and assembling auxiliary/supplementary heater”, page 50](#)
- ⇒ [“2.4.2 Removing and installing auxiliary heater control unit J364”, page 52](#)
- ⇒ [“2.4.3 Removing and installing glow plug for heater Q9”, page 53](#)
- ⇒ [“2.4.4 Removing and installing fuel pre-heating heater element Z66”, page 55](#)
- ⇒ [“2.4.5 Removing and installing combustion air blower V6”, page 56](#)
- ⇒ [“2.4.6 Removing and installing burner element”, page 57](#)
- ⇒ [“2.4.7 Removing and installing heat exchanger”, page 58](#)

2.4.1 Dismantling and assembling auxiliary/supplementary heater



Dismantling auxiliary heater

- Remove auxiliary heater [⇒ page 45](#).
- Detach add-on components of auxiliary heater [⇒ page 64](#).
- Unscrew bolts -8- (4x) and lift cover for water jacket -10-.
- Release clip -9- at bottom, slide it out upwards and detach cover for water jacket -10-.
- Unscrew bolts -3- (4x) and carefully detach cover for combustion air blower - V6- -4- from fuel connection of burner element -20-.

- Unplug 14-pin connector at auxiliary heater control unit -7-.
- Unscrew bolts -1- (4x) and detach cover for combustion air blower - V6- -2-.
- Carefully separate combustion air blower - V6- -5- from water jacket -17-.

 Note

When dismantling the auxiliary heater, ensure that the cables of the temperature sensor - G18-, the temperature sensor 2 for supplementary and auxiliary heating - G587-, the glow plug for heater - Q9-, the fuel pre-heating heater element - Z66- and the flame monitor - G64- are connected in the 14-pin connector. To remove the corresponding components, the electric cables must be released from the 14-pin connector.

Assembling auxiliary heater

Assemble in reverse order; note the following:

 Note

- ◆ Observe notes on auxiliary/supplementary heater [⇒ page 2](#).
- ◆ From 06.2011 onwards, modified auxiliary heaters have been in use (changes to auxiliary heater control unit - J364-, different glow plugs for heater - Q9-, different burner elements for diesel heaters and modified moulded gasket for petrol heaters). Check the correct version and allocation of these parts prior to installation ⇒ *Electronic parts catalogue* .
- ◆ Version -A- of moulded gasket was fitted on petrol heaters until 06.2011. From 06.2011 onwards, version -B- was introduced for noise optimisation. On diesel heaters, version -A- is still installed ⇒ *Electronic parts catalogue* .
- Clean the various components prior to assembly.
- Check the various components for damage. Pay particular attention to the sealing surfaces for the components and any permanently attached seals. Renew components with a damaged sealing surface or seal.

Renew any seals.

Tightening torques

- ◆ [⇒ "2.2 Exploded view - components inside auxiliary/supplementary heater", page 41](#)

2.4.2 Removing and installing auxiliary heater control unit - J364-

Special tools and workshop equipment required

- ◆ Release tool - VAS 1978/18-

Preparations

- Switch off ignition (and auxiliary heater).
- Remove auxiliary heater [⇒ page 45](#) .
- Detach add-on components of auxiliary heater [⇒ page 64](#) .
- Dismantle auxiliary heater [⇒ page 50](#) .

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Removing

- Unplug 14-pin connector -J- from auxiliary heater control unit - J364- -I-.
- Detach auxiliary heater control unit - J364- -I- from water jacket.

Installing

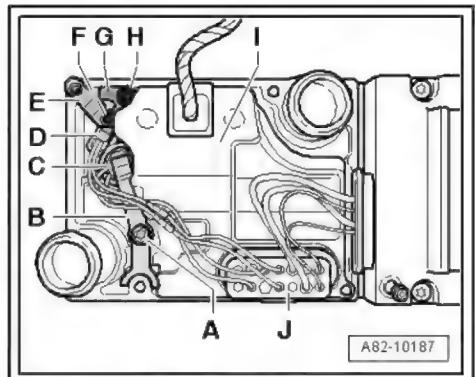
Install in reverse order of removal; note the following.



Caution

If a retaining clip has not been properly fitted or the wrong version is used, coolant will escape when the pressure increases in the coolant circuit.

- ◆ If a retaining clip has not been properly fitted, -G18- or -G587- may work loose.
- ◆ Ensure correct assignment and proper fitting of the retaining clip.



Note

- ◆ Observe notes on auxiliary/supplementary heater [⇒ page 2](#).
- ◆ There are different versions of the retaining clip -B- for the temperature sensor - G18- -C-. -J364- with part number 4xx xxx xxx must only be fitted with retaining clips with a spacer ring. It is therefore important to observe the correct assignment (matching part numbers of retaining clip and auxiliary heater control unit - J364-) [⇒ page 65](#) and [⇒ Electronic parts catalogue](#).

2.4.3 Removing and installing glow plug for heater - Q9-



Note

From 06.2011 onwards, modified auxiliary heaters have been in use (changes to auxiliary heater control unit - J364- , different glow plugs for heater - Q9- , different burner elements for diesel heaters and modified moulded gasket for petrol heaters). Check the correct version and allocation of these parts prior to installation [⇒ Electronic parts catalogue](#) .

Special tools and workshop equipment required

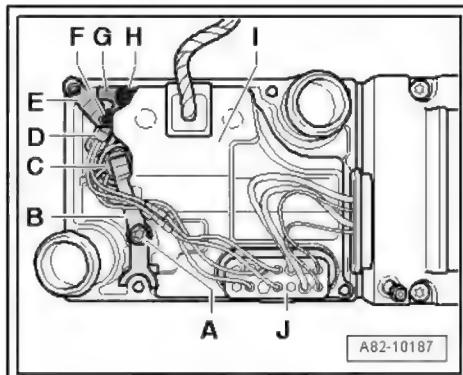
- ◆ Release tool - VAS 1978/18-

Preparations

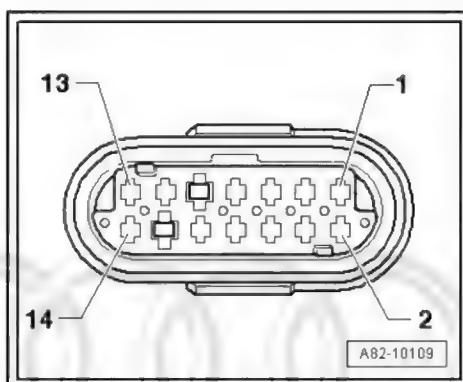
- Switch off ignition (and auxiliary heater).
- Remove auxiliary heater [⇒ page 45](#) .
- Detach add-on components of auxiliary heater [⇒ page 64](#) .
- Dismantle auxiliary heater [⇒ page 50](#) .

Removing

- Unplug 14-pin connector -J- from auxiliary heater control unit - J364- -I-.



- Press wires of glow plug for heater - Q9- in contacts 3 and 6 out of 14-pin connector housing.

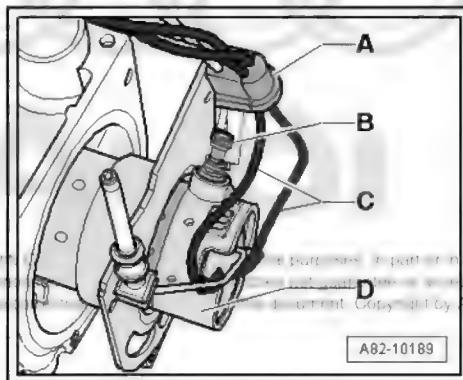


- Pull wires of fuel pre-heating heater element - Z66- -C- out of seal -A- towards one side.
- Pull glow plug for heater - Q9- -B- out of burner element -D-.

Installing

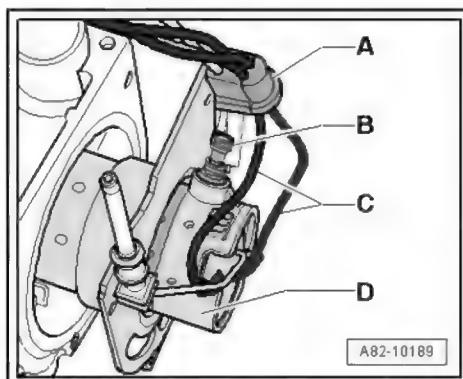
Install in reverse order of removal; note the following.

For the fuel pre-heating heater element - C - and the glow plug for heater - Q9 - it is important to observe the correct assignment of the leads. If the leads are swapped, the heater will not heat up correctly. The correct assignment of the leads is indicated by markings on the heater element and the glow plug. The markings must be aligned with the correct pins in the connector. Failure to do so may result in damage to the heater element or the glow plug.



Note

- ◆ There are different versions of the glow plug for heater - Q9-. It is therefore important to observe the correct assignment ⇒ Electronic parts catalogue .
- ◆ If the glow plug for heater - Q9- is faulty, check and clean the burner element. Renew the burner element if deposits have formed which affect heating operation and cannot be removed with workshop equipment ⇒ page 57 .
- ◆ Before fitting, check the leads to the glow plug for heater - Q9-. They must not be damaged or show signs of overheating (risk of short circuit).
- ◆ When installing, ensure that the leads to the glow plug for heater - Q9- -B- and to the fuel pre-heating heater element - Z66- -C- are correctly routed and attached, and check the position of the seal -A-.



2.4.4 Removing and installing fuel pre-heating heater element - Z66-

Special tools and workshop equipment required

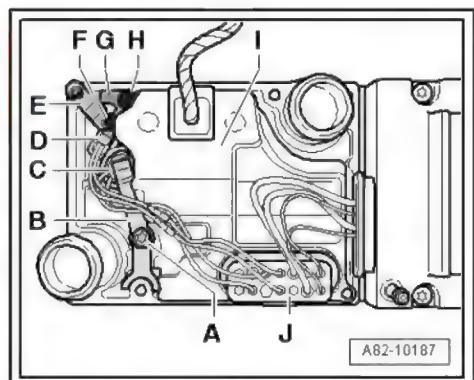
- ◆ Release tool - VAS 1978/18-

Preparations

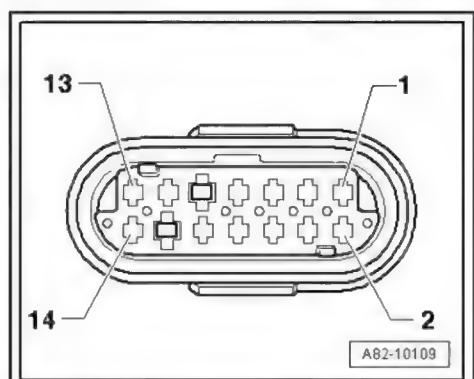
- Switch off ignition (and auxiliary heater).
- Remove auxiliary heater [⇒ page 45](#).
- Detach add-on components of auxiliary heater [⇒ page 64](#).
- Dismantle auxiliary heater [⇒ page 50](#).

Removing

- Unplug 14-pin connector -J- from auxiliary heater control unit - J364- -I-.



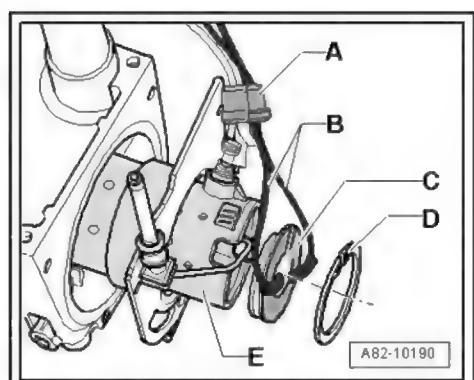
- Press wires of fuel pre-heating heater element - Z66- in contacts **9** and **12** out of 14-pin connector housing, part of which is not per the drawing. Only Audi AG and its suppliers are entitled to make changes to the drawings. Changes made by others without the written consent of Audi AG will be rejected. The current version of the drawing can be found at [http://www.audi.com/technical-drawings](#)



- Pull wires -B- of fuel pre-heating heater element - Z66- -C- out of seal -A- towards one side.
- Remove circlip -D- and detach fuel pre-heating heater element - Z66- -C- with seal and plate.

Installing

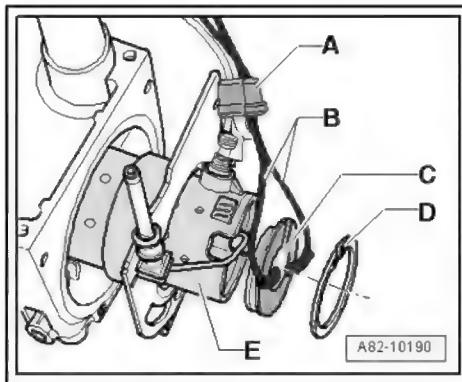
Install in reverse order of removal; note the following.





Note

- ◆ If the fuel pre-heating heater element - Z66- is faulty, check and clean the burner element. Renew the burner element if deposits have formed which affect heating operation and cannot be removed with workshop equipment [⇒ page 57](#).
- ◆ Before fitting, check the leads to the fuel pre-heating heater element - Z66-. They must not be damaged or show signs of overheating (risk of short circuit).
- ◆ When installing, ensure that the leads to the fuel pre-heating heater element - Z66- are correctly routed and attached.
- ◆ Renew seals.
- ◆ When installing, ensure that the leads -B- to the fuel pre-heating heater element - Z66- -C- are correctly routed and attached; check the position of the seal -A-.



2.4.5 Removing and installing combustion air blower - V6-

Special tools and workshop equipment required

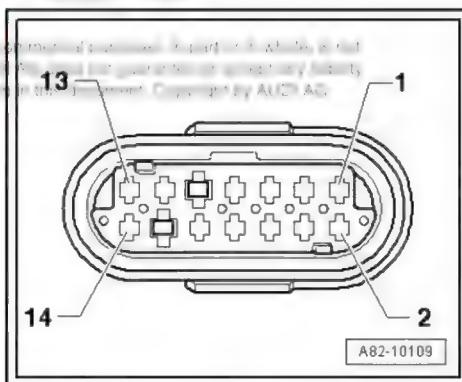
- ◆ Release tool - VAS 1978/18-

Preparations

- Switch off ignition (and auxiliary heater).
- Remove auxiliary heater [⇒ page 45](#).
- Detach add-on components of auxiliary heater [⇒ page 64](#).
- Dismantle auxiliary heater [⇒ page 50](#).

Removing

- Removing and installing flame monitor G64 [⇒ page 64](#).
- Press wires of combustion air blower - V6- in contacts 13 and 14 out of 14-pin connector housing.



- Detach combustion air blower - V6- [⇒ page 50](#).

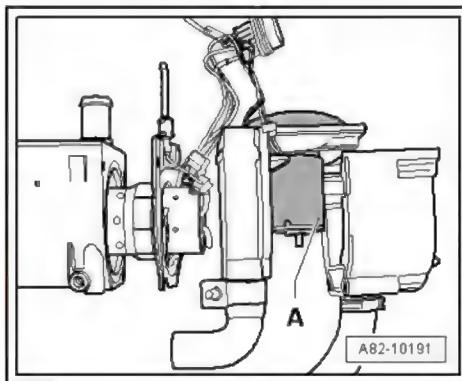
Installing

Install in reverse order of removal; note the following.



Note

Before installing the combustion air blower - V6-, renew the moulded gasket (between combustion air blower - V6- and heater).



2.4.6 Removing and installing burner element

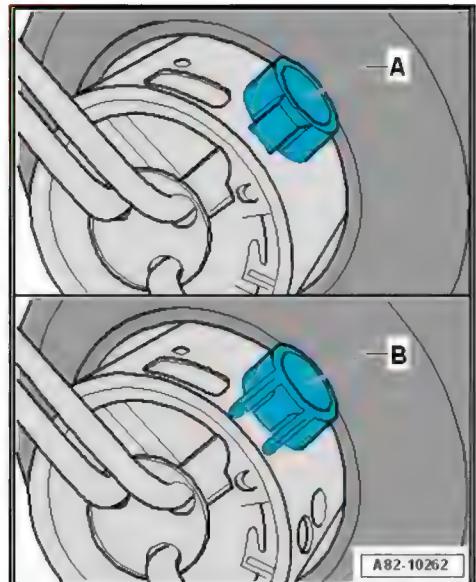
Preparations

- Switch off ignition (and auxiliary heater).
- Remove auxiliary heater [⇒ page 45](#).
- Detach add-on components of auxiliary heater [⇒ page 64](#).
- Dismantle auxiliary heater [⇒ page 50](#).
- Remove glow plug for heater - Q9- [⇒ page 53](#).
- Remove fuel pre-heating heater element - Z66- [⇒ page 55](#).



Note

- ◆ From 06.2011 onwards, modified auxiliary heaters have been in use (changes to auxiliary heater control unit - J364-, different glow plugs for heater - Q9-, different burner elements for diesel heaters and modified moulded gasket for petrol heaters). Check the correct version and allocation of these parts prior to installation ⇒ *Electronic parts catalogue*.
- ◆ You can tell the difference between the two burner elements for diesel heaters by looking at the connection piece for the glow plug for heater - Q9-. Version -A- was installed until 06.2011 and version -B- was installed from 06.2011 onwards ⇒ *Electronic parts catalogue*.
- ◆ If a version -B- burner element is installed in a diesel heater which previously had a version -A- burner element, the concentration of CO₂ in the exhaust gases will increase. Please therefore refer to
[⇒ "4.6 Checking CO₂ content in auxiliary heater exhaust gas", page 98](#).



Removing

- Pull burner element -B- out of heat exchanger -A-.

Installing

Install in reverse order of removal; note the following.

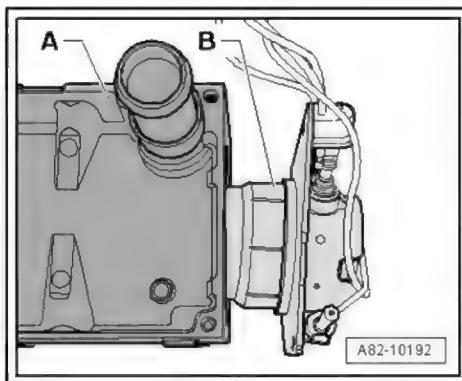


Note

- ◆ Before installing burner element -B-, renew moulded gasket (between burner element and heater) [⇒ Item 21 \(page 45\)](#).
- ◆ If the burner element is faulty, also renew the glow plug for heater - Q9- .

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- If necessary, clean inside and outside of burner element -B- with a brass wire brush (spark plug brush).
- If necessary, clean inside of heat exchanger -A- with a brass wire brush (spark plug brush).
- Check sealing surfaces at burner element -B- and heat exchanger -A- for damage.



Note

Renew the burner element if deposits have formed which affect heating operation and cannot be removed with workshop equipment.

2.4.7 Removing and installing heat exchanger

Preparations

- Switch off ignition (and auxiliary heater).
- Remove auxiliary heater [⇒ page 45](#).
- Detach add-on components of auxiliary heater [⇒ page 64](#).
- Dismantle auxiliary heater [⇒ page 50](#).
- Remove glow plug for heater - Q9- [⇒ page 53](#).
- Remove fuel pre-heating heater element - Z66- [⇒ page 55](#).
- Remove burner element [⇒ page 57](#).

Removing

- Use a suitable screwdriver to carefully press heat exchanger through rear coolant connecting pipe (water inlet) -arrow A- out of water jacket in direction of arrow -B- [⇒ page 41](#).

Installing

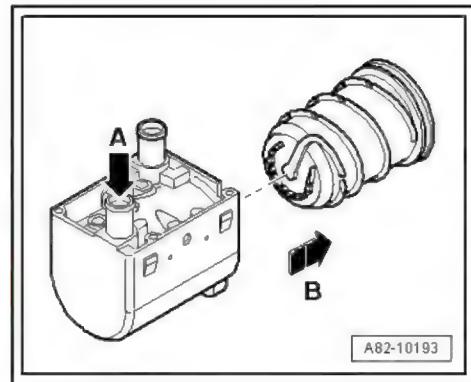
Install in reverse order of removal; note the following.

- If necessary, clean inside and outside of heat exchanger with brass wire brush (spark plug brush).

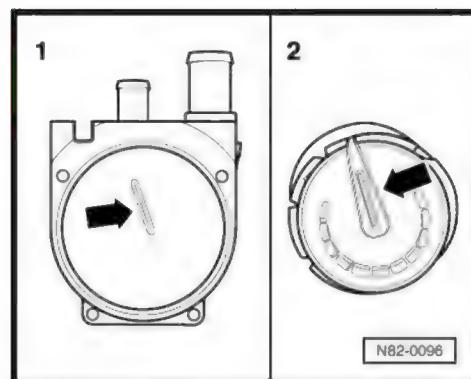


Note

Renew the heat exchanger if deposits have formed which affect heating operation and cannot be removed with workshop equipment.



- Check sealing surfaces on heat exchanger for damage.
- Always renew O-ring before assembly [⇒ Item 19 \(page 44\)](#).
- Ensure that heat exchanger is installed in correct position -arrows-.



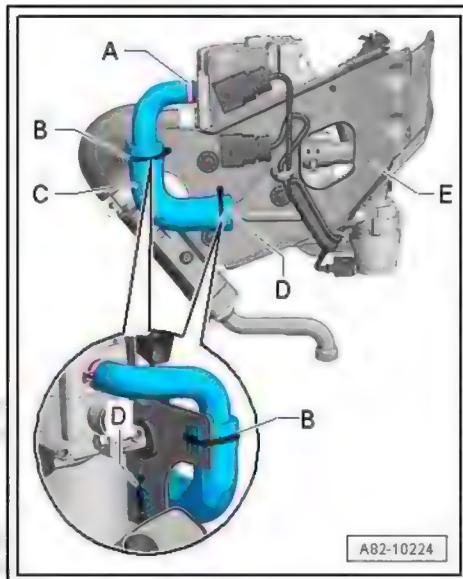
2.5 Removing and installing air intake silencer

Removing

- Switch off ignition (and auxiliary heater).
- Remove front wheel (right-side) [⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .](#)
- Remove wheel housing liner and wheel spoiler (front right) [⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner .](#)

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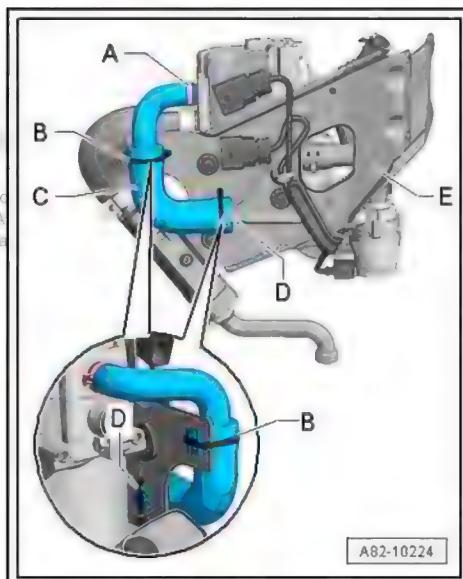
- Unfasten clamp -A-.
- Remove cable ties -B- and -D-.
- Detach intake air noise insulation -C- from heater.



Installing

Install in reverse order of removal; note the following.

- Renew clamp -A- with one of the same type ⇒ Electronic parts catalogue .
- Slide intake air noise insulation onto auxiliary heater air intake connection as far as stop and use suitable pliers to secure clamp -A-. AUDI AG A
with respect to the correctness of me
- Secure intake air noise insulation -C- at locations provided on bracket -E- with cable ties -B- and -D-.



2.6 Removing and installing circulation pump - V55-



WARNING

The cooling system is pressurised. When the engine is warm, the coolant temperature may be above 90 °C. Release pressure and wait for temperature to drop before performing repairs. Release pressure in coolant circuit by opening cap on coolant expansion tank ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .



Note

- ◆ Depending on vehicle equipment, the circulation pump - V55- may also be activated by the auxiliary heater control unit - J364- when a request is transmitted by the corresponding engine control unit or the air conditioner operating unit (Climatronic control unit - J255-) via the data bus ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- ◆ A start/stop system is available as an optional extra for certain engines. On these versions, ensure that the correct versions of the air conditioner operating unit (Climatronic control unit - J255-) and auxiliary heater are used ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ On vehicles with a start/stop system, the circulation pump - V55- of the auxiliary heater is activated by the auxiliary heater control unit - J364- while the stop function is active. The auxiliary heater control unit - J364- is requested to switch on the circulation pump - J255- via the data bus by the air conditioner operating unit (Climatronic control unit - V55-) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ The circulation pump - V55- is incorporated into the auxiliary heater hoses.
- ◆ When removing the circulation pump - V55-, only clamp off, release and disconnect the coolant hoses at -V55- so that the entire engine coolant circuit does not have to be bled.

Special tools, testers and other devices required

- ◆ Hose clamps up to Ø 25 mm - 3094-
- ◆ Hose clip pliers - VAS 6340-

Removing

- Switch off ignition and auxiliary heater.
- Release pressure in coolant circuit by opening cap on coolant expansion tank.
- Remove front right wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Remove wheel spoiler (front right) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (front) .

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- Clamp off coolant hoses -I- and -H- (e.g. with hose clamps up to Ø 25 mm - 3094-).
- Unfasten clamps -B- and -G-.
- Detach coolant hose -H- from circulation pump - V55- -F-.
- Unfasten nut -E- and detach retainer -D-.
- Detach circulation pump - V55- -F- from coolant hose -A-.
- Unplug electrical connector -C- from circulation pump - V55- -F- and remove circulation pump - V55- .

Installing

Install in reverse order of removal; note the following.



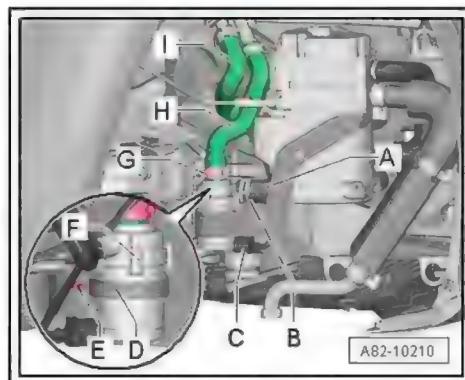
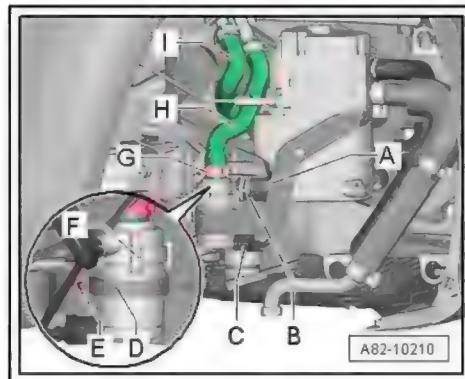
Note

- ◆ If the coolant circuit has been drained, a new circulation pump - V55- must not be started up until the coolant circuit has been filled to prevent the pump from being damaged irreparably when it is run dry.
- ◆ As only a small quantity of coolant escapes from the coolant circuit during removal of the circulation pump - V55- (as described above), coolant runs into the circulation pump - V55- following installation and after removing the hose clamps (additionally open the coolant expansion tank cap), and there is no danger that the pump will run dry.

- Fill coolant expansion tank with coolant as far as upper mark
⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .
- Butt-joint circulation pump - V55- -F- at coolant hose -A- and secure at marked locations with clamp -B- using suitable pliers.
- Carefully release hose clamps up to Ø 25 mm - 3094- at coolant hose -I- and allow coolant to flow into auxiliary heater.
- As soon as coolant emerges from upper connection of circulation pump - V55- -F-, attach coolant hose -H- to circulation pump - V55- -F- and secure clamp -G- using suitable pliers.
- Plug in electrical connector -C- for circulation pump - V55- -F-.
- Bleed coolant circuit [⇒ page 81](#) .

Tightening torques

- ◆ [⇒ "2.1 Overview of fitting locations - auxiliary/supplementary heater", page 37](#)



2.7 Removing and installing exhaust system

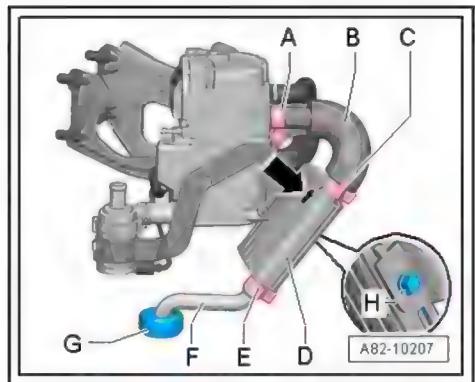
Removing

- Switch off ignition (and auxiliary heater).
- Remove wheel housing liner and wheel spoiler (front right) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (front) .
- Unscrew bolt -H- ([Item 7 \(page 38\)](#) securing exhaust silencer to bracket [page 64](#)).
- Unscrew bolt from clamp -A- and detach exhaust system.



Note

- ◆ *Release clamps -C- and -E- to continue dismantling exhaust system.*
- ◆ *If there is an arrow on the exhaust silencer, this can be disregarded as it does not show the direction of flow and is not relevant to the function.*

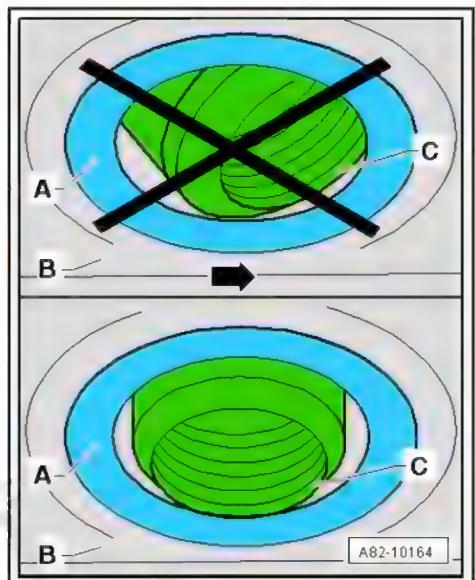


Installing

Install in reverse order of removal; note the following.

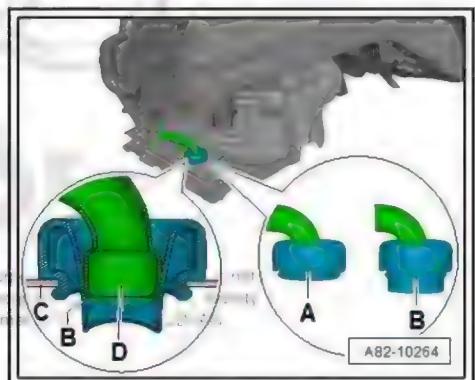
Tightening torques

- ◆ ["2.1 Overview of fitting locations - auxiliary/supplementary heater", page 37](#)
- Make sure that exhaust system is not making contact with any other component.
- After fitting front noise insulation, check rubber grommet -A- and exhaust pipe of auxiliary heater. Rubber grommet -A- must be positioned in noise insulation -B- so it is free of stress; exhaust pipe must be flush with rubber grommet -A- or protrude slightly out of rubber grommet -A-.
- After working on auxiliary heater or noise insulation, check end of exhaust pipe -C-; it must be installed so it is at a right angle to the noise insulation -B- at the point where it passes through rubber grommet -A- fitted in noise insulation.



Note

- ◆ *If there is an arrow on the exhaust silencer, this can be disregarded as it does not show the direction of flow and is not relevant to the function.*
- ◆ *End of exhaust pipe -C- must not face in direction of travel -arrow-; otherwise air stream could cause increased counter-pressure in exhaust system while vehicle is in motion.*
- ◆ *A modified rubber grommet is being gradually introduced on certain vehicles in model year 2013. The new rubber grommet -B- is longer than the old one; this improves the flow characteristics at the exhaust pipe when the vehicle is travelling with the auxiliary heater running. It therefore protrudes somewhat further out of the noise insulation -C- than the old rubber grommet -A-. The position of the exhaust pipe -D- is the same with both rubber grommets.*

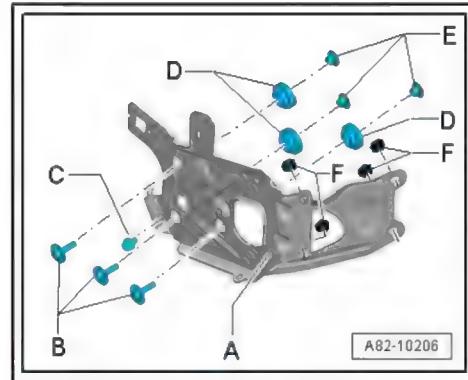


2.8 Removing and installing bracket for auxiliary/supplementary heater

- A- Bracket for auxiliary heater
- B- Bolt; secures auxiliary heater to bracket
- C- Wiring clip; secures wires to bracket
- D- Rubber elements for noise insulation; secure auxiliary heater to bracket
- E- Bushes; secure auxiliary heater to bracket
- F- Nut; removing and installing auxiliary heater [⇒ page 45](#)

Tightening torques

- ◆ [⇒ "2.1 Overview of fitting locations - auxiliary/supplementary heater", page 37](#)



2.9 Removing and installing flame monitor - G64-

Special tools and workshop equipment required

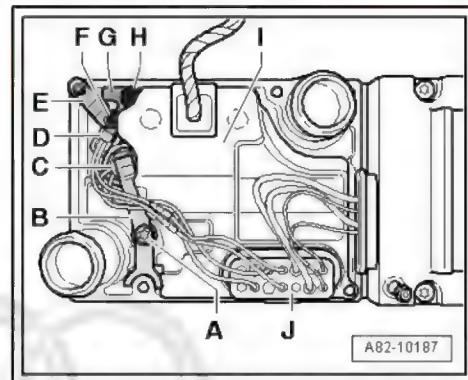
- ◆ Release tool - VAS 1978/18-

Preparations

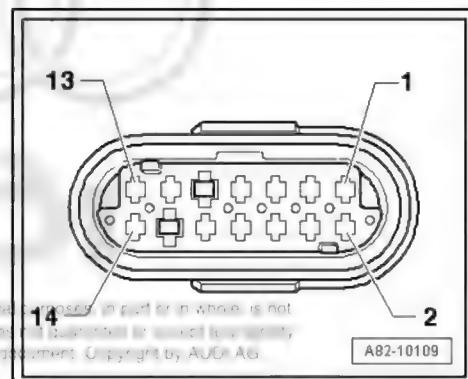
- Switch off ignition (and auxiliary heater).
- Remove auxiliary heater [⇒ page 45](#).
- Detach add-on components of auxiliary heater [⇒ page 64](#).
- Dismantle auxiliary heater [⇒ page 50](#).

Removing

- Unplug 14-pin connector -J- from auxiliary heater control unit - J364- -I-.

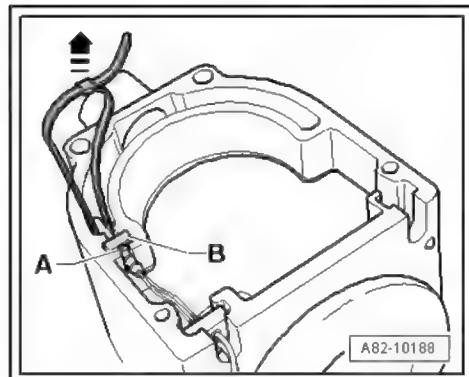


- Press wires of flame monitor - G64- in contacts 1 and 2 out of 14-pin connector housing.



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- Use a commercially available cable tie to pull flame monitor - G64- -A- together with graphite seal -B- out of housing for combustion air blower - V6- in direction of -arrow-.



Installing

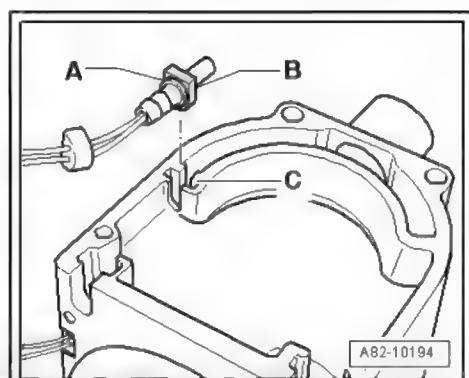
Install in reverse order of removal; note the following.

- Check graphite seal -B- and renew if damaged.



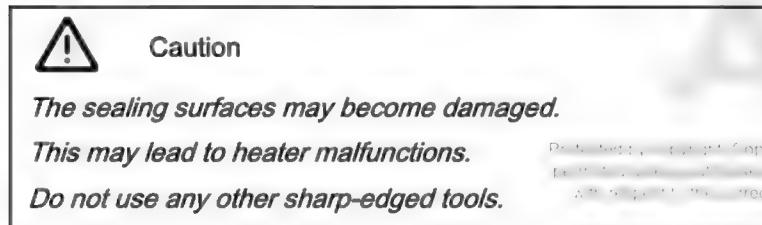
The graphite seal is supplied together with the flame monitor - G64 -> Electronic parts catalogue .

- Fit graphite seal -B- on flame monitor - G64- -A-.

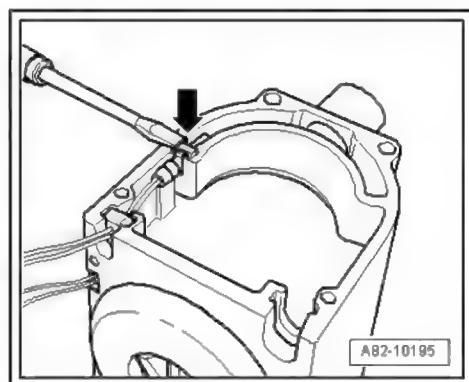


The burless side of the graphite seal -B- must face the collar of the flame monitor - G64- -A-.

- Insert flame monitor - G64- in groove -C- in housing for combustion air blower - V6- .



- Use a screwdriver to press in graphite seal in direction of -arrow-.



2.10 Removing and installing temperature sensor - G18-

Special tools and workshop equipment required

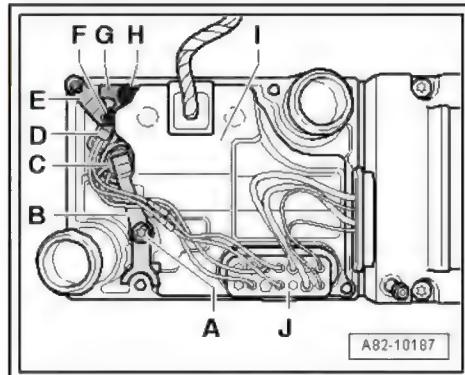
◆ Release tool - VAS 1978/18-

Preparations

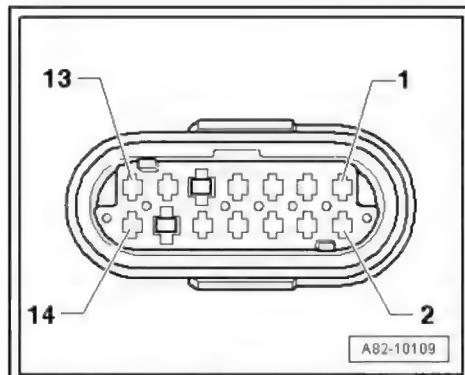
- Switch off ignition (and auxiliary heater).
- Remove auxiliary heater [⇒ page 45](#).
- Detach add-on components of auxiliary heater [⇒ page 64](#).
- Dismantle auxiliary heater [⇒ page 50](#).

Removing

- Unplug 14-pin connector -J- from auxiliary heater control unit - J364- -I-.



- Press wires of temperature sensor - G18- in contacts 10 and 11 out of 14-pin connector housing.

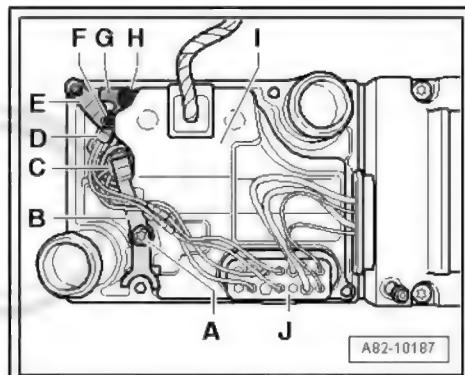


- Unscrew bolt -A- and detach retaining clip -B-.
- Pull out temperature sensor - G18- -C-.



Note

On certain versions, the wires to the temperature sensor - G18- are twisted together with the wires to the temperature sensor 2 for supplementary and auxiliary heating - G587-. In this case, the temperature sensor 2 for supplementary and auxiliary heating - G587- must also be removed [⇒ page 67](#).



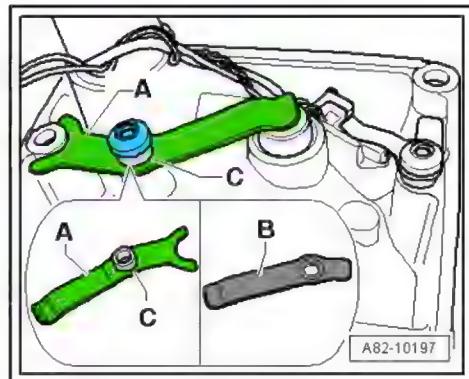
Installing

Install in reverse order of removal; note the following.



Note

There are different versions of the retaining clip for the temperature sensor - G18- and the temperature sensor 2 for supplementary and auxiliary heating - G587- . -J364- with part number 4xx xxx xxx must only be fitted with retaining clips -A- with a spacer ring -C-. Attention must therefore be paid to correct assignment (matching part numbers of retaining clip and auxiliary heater control unit - J364-) ⇒ Electronic parts catalogue .



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If a retaining clip has not been properly fitted or the wrong version is used, coolant will escape when the pressure increases in the coolant circuit.

- ◆ If a retaining clip has not been properly fitted, -G18- or -G587- may work loose.
- ◆ Ensure correct assignment and proper fitting of the retaining clip.

- Clean connection area and temperature sensor - G18- and check for damage.
- Renew O-ring.
- Coat O-ring with small quantity of coolant.

2.11 Removing and installing temperature sensor 2 for supplementary and auxiliary heating - G587-

Special tools and workshop equipment required

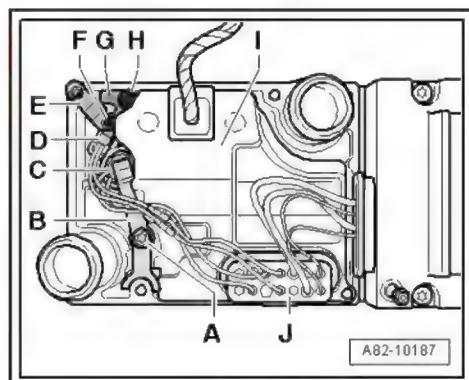
- ◆ Release tool - VAS 1978/18-

Preparations

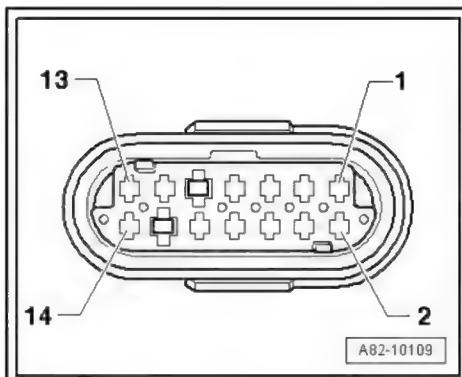
- Switch off ignition (and auxiliary heater).
- Remove auxiliary heater [⇒ page 45](#).
- Detach add-on components of auxiliary heater [⇒ page 64](#).
- Dismantle auxiliary heater [⇒ page 50](#).

Removing

- Unplug 14-pin connector -J- from auxiliary heater control unit - J364- -I-.



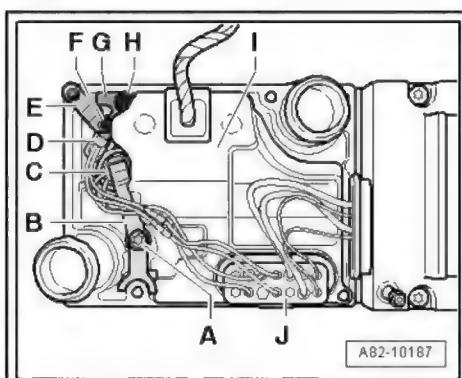
- Press wires of temperature sensor 2 for supplementary and auxiliary heating - G587- in contacts 7 and 8 out of 14-pin connector housing.



- Unscrew bolt -F- and detach earth strap -E-.
- Unscrew bolt -H- and detach retaining clip -G-.
- Take out temperature sensor 2 for supplementary and auxiliary heating - G587- -D-.



On certain versions, the wires to the temperature sensor 2 for supplementary and auxiliary heating - G587- are twisted together with the wires to the temperature sensor - G18-. In this case, the temperature sensor - G18- must also be removed [⇒ page 65](#).

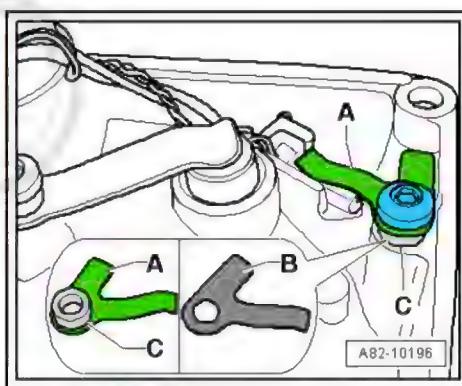


Installing

Install in reverse order of removal; note the following.



There are different versions of the retaining clip for the temperature sensor - G18- and the temperature sensor 2 for supplementary and auxiliary heating - G587-. -J364- with part number 4xx xxx xxx must only be fitted with retaining clips -A- with a spacer ring -C-. Attention must therefore be paid to correct assignment (matching part numbers of retaining clip and auxiliary heater control unit - J364-) ⇒ Electronic parts catalogue .



Caution

If a retaining clip has not been properly fitted or the wrong version is used, coolant will escape when the pressure increases in the coolant circuit.

- ◆ If a retaining clip has not been properly fitted, -G18- or -G587- may work loose.
- ◆ Ensure correct assignment and proper fitting of the retaining clip.

2.12 Pin assignment for auxiliary/supplementary heater

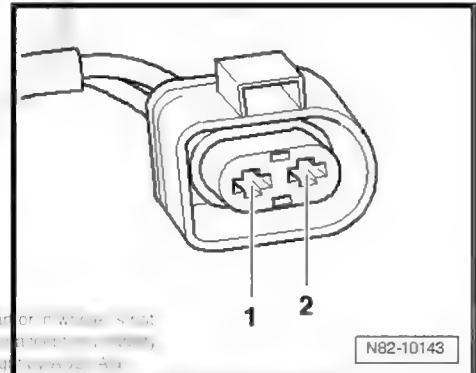


Note

*Incorporation of auxiliary heater into vehicle electrical system
 ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.*

Assignment of contacts in 2-pin connector (wire from auxiliary heater control unit - J364- to circulation pump - V55-)

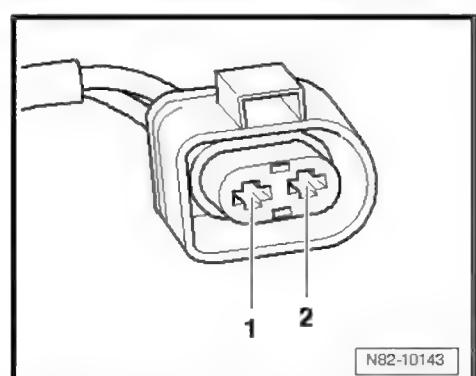
- 1 - Activation of circulation pump - V55-
- 2 - Earth connection to circulation pump - V55-



N82-10143

Assignment of contacts in 2-pin connector (in-vehicle wiring to auxiliary heater control unit - J364-)

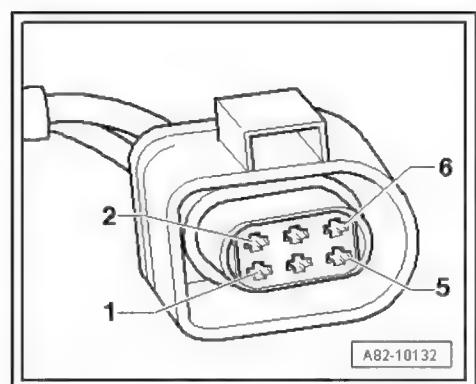
- 1 - Power supply, terminal 30
- 2 - Earth connection



N82-10143

Assignment of contacts in 6-pin connector (in-vehicle wiring to auxiliary heater control unit - J364-)

- 1 - Data line to data bus (high-speed CAN bus)
- 2 - Data line to data bus (low-speed CAN bus)
- 3 - Activation of heater coolant shut-off valve - N279-
- 4 - Activation of metering pump - V54-
- 5 - Currently not used
- 6 - Data line from remote control receiver for auxiliary heater - R64-



A82-10132

2.13 Checking electrical components on auxiliary/supplementary heater

- ⇒ "2.13.1 Checking activation and electrical connections of auxiliary/supplementary heater", page 70
- ⇒ "2.13.2 Preparation for checking components on auxiliary heater", page 70
- ⇒ "2.13.3 Checking glow plug for heater Q9", page 71
- ⇒ "2.13.4 Checking combustion air blower V6", page 72
- ⇒ "2.13.5 Checking flame monitor G64", page 72
- ⇒ "2.13.6 Checking temperature sensor G18", page 73
- ⇒ "2.13.7 Checking temperature sensor 2 for supplementary and auxiliary heating G587", page 74
- ⇒ "2.13.8 Checking fuel pre-heating heater element Z66", page 75

2.13.1 Checking activation and electrical connections of auxiliary/supplementary heater

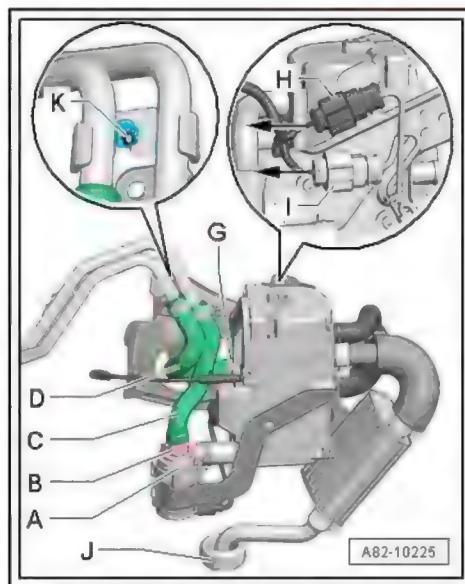


Note

- ◆ The "Electrical check" function is not described in this Workshop Manual. The procedure for checking individual components is only outlined briefly in this Workshop Manual.
- ◆ Perform electrical check as described in Guided Fault Finding
⇒ Vehicle diagnostic tester ("Guided Fault Finding").

Procedure

- Switch off ignition (and auxiliary heater).
- Remove wheel housing liner and wheel spoiler (front right) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner .
- Release 2-pin connector -H- and 6-pin connector -I- and unplug in direction of -arrows-.
- Perform electrical checks as described in "Guided Fault Finding" ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



2.13.2 Preparation for checking components on auxiliary heater

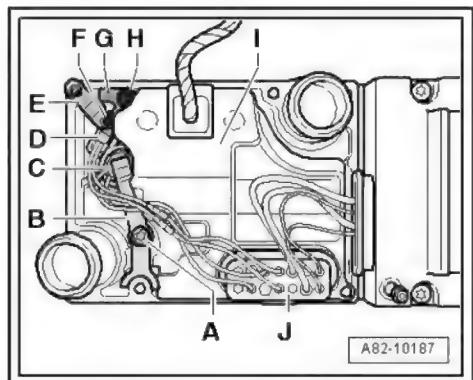
- Remove auxiliary heater ⇒ page 45 .
- Detach add-on components of auxiliary heater ⇒ page 64 .
- Detach cover for auxiliary heater control unit - J364-
⇒ page 41 .

Summary of electrical checks to be performed

Component checked	Page
Glow plug for heater - Q9-	⇒ page 71
Combustion air blower - V6-	⇒ page 72
Flame monitor - G64-	⇒ page 72
Temperature sensor - G18-	⇒ page 73
Temperature sensor 2 for supplementary and auxiliary heating - G587-	⇒ page 74
Fuel pre-heating heater element - Z66-	⇒ page 75

2.13.3 Checking glow plug for heater - Q9-

- Preparation for checking auxiliary heater components performed ⇒ page 70 .
- Unplug connector -J- from auxiliary heater control unit - J364- -I-.



- Measure resistance at connector between contact "3" and heater housing.

Specification:

$\infty \Omega$

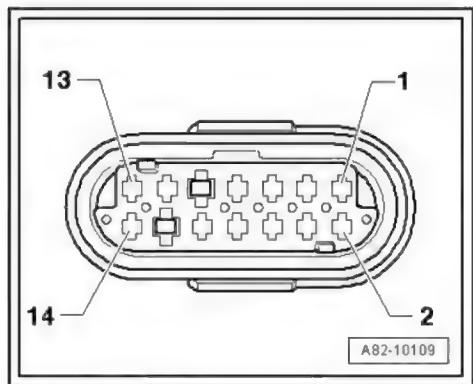
- Measure resistance at connector between contacts "3" and "6".

Specification:

Less than 1Ω

Rated value:

$0.42 - 0.63 \Omega_{\sim}$ (at $20 + / - 2^{\circ}\text{C}$)



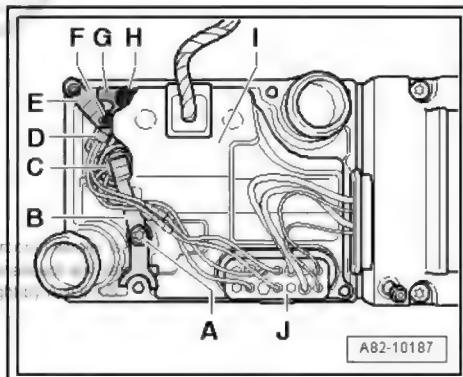
Note

- ◆ Resistances of less than 1Ω cannot be measured as exactly as required using workshop equipment. Therefore this test can only be used to detect major damage to the component.
- ◆ If a voltage of 9 V is applied to the glow plug for heater - Q9-, the power input is between 9 and 20 A.

2.13.4 Checking combustion air blower - V6-

- Preparation for checking auxiliary heater components performed [⇒ page 70](#).
- Unplug connector -J- from auxiliary heater control unit - J364--I-.

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- Measure resistance at connector between contact "13" and heater housing.

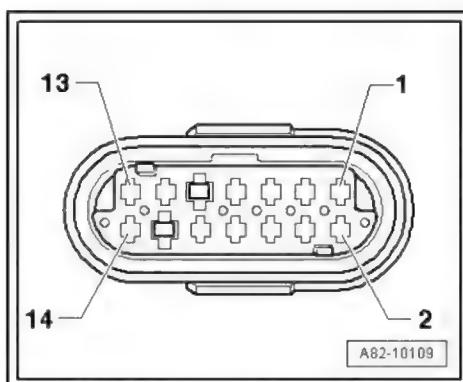
Specification:

$\infty \Omega$



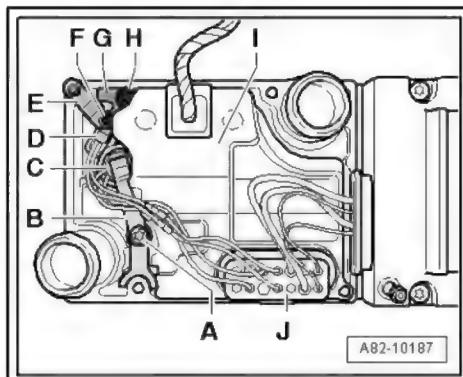
Note

- If a voltage of 12 V is applied to the combustion air blower - V6- the power input is between 2 and 3 A.
- The internal resistance of the combustion air blower - V6- is between 3 and 6 Ω (40 Ω if the combustion air blower has not been in operation for a lengthy period). Resistances of less than 10 Ω cannot be measured as exactly as required using workshop equipment. Therefore this internal resistance test can only be used to detect major damage to the component.

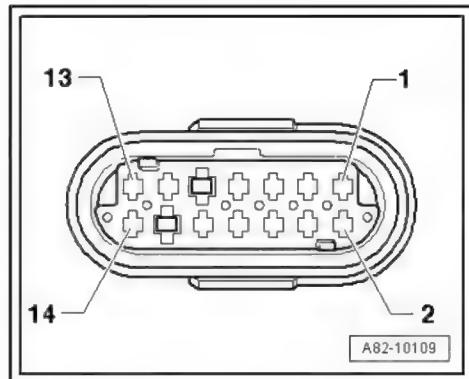


2.13.5 Checking flame monitor - G64-

- Preparation for checking auxiliary heater components performed [⇒ page 70](#).
- Unplug connector -J- from auxiliary heater control unit - J364--I-.



- Measure resistance between contact "2" and contact "1" at brown wires.



Evaluation:

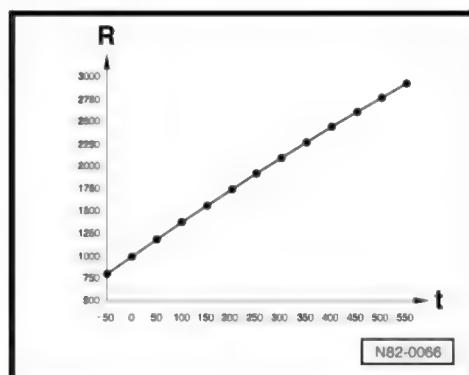
R = Resistance in Ω (ohms)

t = Temperature in $^{\circ}\text{C}$ (degrees Celsius)

- Measure resistance at current temperature.

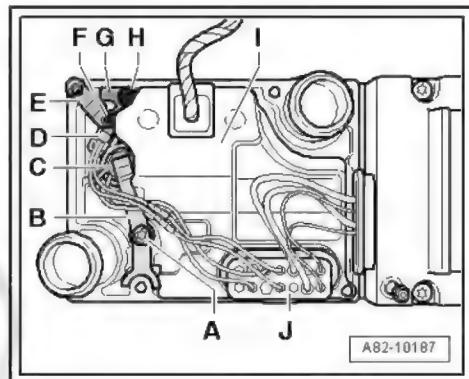
Evaluation:

- ◆ Resistance value greater than 3040Ω = open circuit (defective)
- ◆ Resistance value less than 780Ω = short circuit (defective)

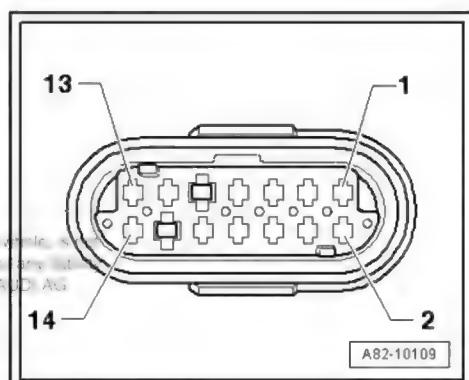


2.13.6 Checking temperature sensor - G18-

- Preparation for checking auxiliary heater components performed [page 70](#).
- Unplug connector -J- from auxiliary heater control unit - J364-I-.



- Measure resistance between contact "10" and contact "11" at black wires.



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Evaluation:

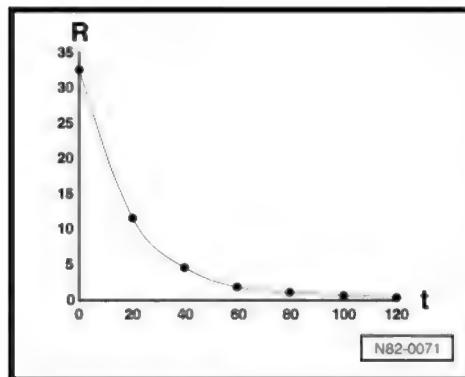
R = Resistance in kΩ (kilohms)

t = Temperature in °C (degrees Celsius)

- Measure resistance at current temperature.

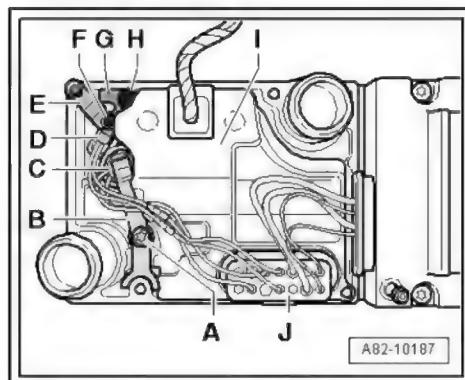
Evaluation:

- ◆ Resistance value greater than 2 MΩ (megaohms) = open circuit (defective)
- ◆ Resistance less than 50 Ω = short circuit (defective)

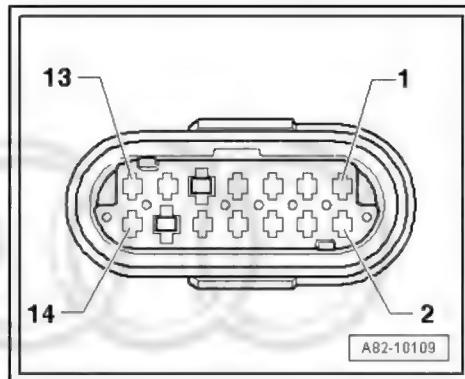


2.13.7 Checking temperature sensor 2 for supplementary and auxiliary heating - G587-

- Preparation for checking auxiliary heater components performed [⇒ page 70](#).
- Unplug connector -J- from auxiliary heater control unit - J364--I-.



- Measure resistance between contact "7" and contact "8" at white wires.



Evaluation:

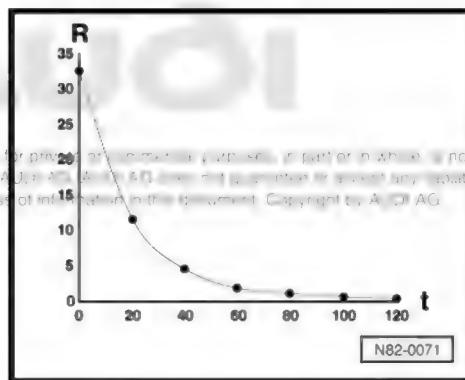
R = Resistance in kΩ (kilohms)

t = Temperature in °C (degrees Celsius)

- Measure resistance at current temperature.

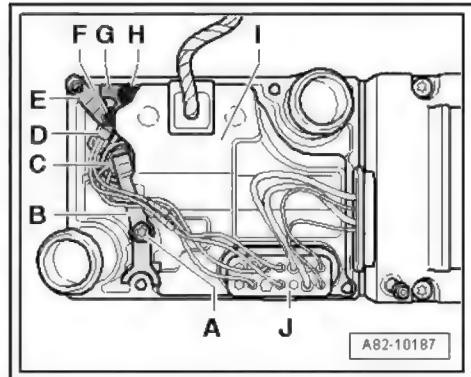
Evaluation:

- ◆ Resistance value greater than 2 MΩ (megaohms) = open circuit (defective)
- ◆ Resistance less than 50 Ω = short circuit (defective)



2.13.8 Checking fuel pre-heating heater element - Z66-

- Preparation for checking auxiliary heater components performed [⇒ page 70](#).
- Unplug connector **-J-** from auxiliary heater control unit - J364-
-I-.



- Measure resistance between contact "9" and contact "12" at white wires.

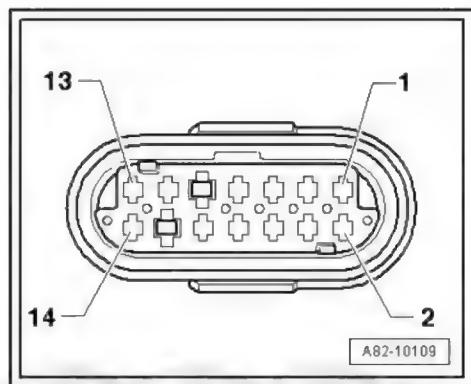
Specification:

0.79 - 0.97 Ω (ohms at 23 + / -5 °C)



Note

Resistances of less than 1 Ω cannot be measured as exactly as required using workshop equipment. Therefore this test can only be used to detect major damage to the component.





3 Coolant circuit with auxiliary/supplementary heater

- ⇒ “3.1 Connection diagram - coolant hoses”, page 76
- ⇒ “3.2 Removing and installing heater coolant shut-off valve”, page 78

3.1 Connection diagram - coolant hoses



Note

- ◆ The -arrows- indicate the direction of coolant flow.
- ◆ If the heater coolant shut-off valve - N279- [⇒ Item 8 \(page 77\)](#) is activated (e.g. in auxiliary heating mode with cold coolant and ignition switched off), the coolant is drawn in from the heat exchangers of the air conditioning unit [⇒ Item 1 \(page 77\)](#) by the circulation pump - V55- [⇒ Item 3 \(page 77\)](#).
- ◆ If -N279- [⇒ Item 8 \(page 77\)](#) is not activated (e.g. with warm coolant and ignition switched on), the coolant is drawn in from the engine [⇒ Item 5 \(page 77\)](#) by -V55- and flows from the heat exchanger of the air conditioning unit [⇒ Item 1 \(page 77\)](#) via -N279- [⇒ Item 8 \(page 77\)](#) back to the engine [⇒ Item 7 \(page 77\)](#).
- ◆ Bleeding coolant circuit ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system and [⇒ page 81](#).
- ◆ For information on components not mentioned here, refer to [⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses](#).
- ◆ Incorporation of air conditioner into coolant circuit ⇒ Heating, air conditioning; Rep. gr. 87 ; Coolant circuit .

1 - Heat exchanger for heater in air conditioning unit

- Removing and installing
⇒ Heating, air conditioning; Rep. gr. 87 ;
Heater and air conditioning unit (front); Re-
moving and installing heat exchanger

2 - Auxiliary heater

- Removing and installing
⇒ [page 45](#)

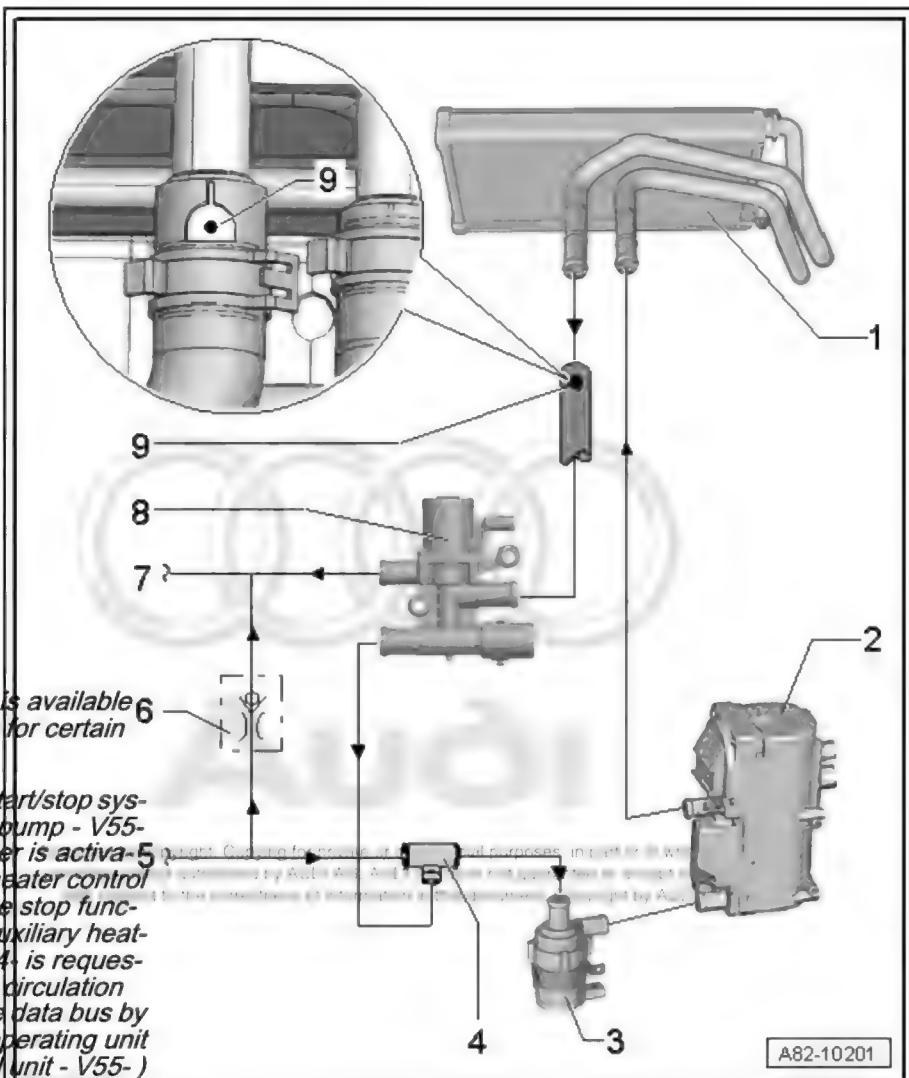
3 - Circulation pump - V55-

- The circulation pump - V55- is incorporated into the auxiliary heater hoses.
- Removing and installing
⇒ [page 60](#)



Note

- ◆ A start/stop system is available as an optional extra for certain engines.
- ◆ On vehicles with a start/stop system, the circulation pump - V55- of the auxiliary heater is activated by the auxiliary heater control unit - J364- while the stop function is active. The auxiliary heater control unit - J364- is requested to switch on the circulation pump - J255- via the data bus by the air conditioner operating unit (Climatronic control unit - V55-)
⇒ Vehicle diagnostic tester ("Guided Fault Finding").



A82-10201

4 - Outlet in coolant supply to auxiliary heater

- Different versions; branch in coolant pipe also possible

5 - Coolant supply from engine

- Incorporation of air conditioner into engine coolant circuit ⇒ Heating, air conditioning; Rep. gr. 87 ;
Coolant circuit and ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses

6 - Non-return valve

- Only fitted on some versions, e.g. on some vehicles with 2.0 ltr. TDI engine ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses
- Note direction of flow
- Check direction of flow by blowing through valve
- Incorrect installation will result in reduced output from the auxiliary heater/vehicle heating system

7 - Coolant return to engine

- Incorporation of air conditioner into engine coolant circuit ⇒ Heating, air conditioning; Rep. gr. 87 ;
Coolant circuit and ⇒ Rep. gr. 19 ; Cooling system/coolant; Connection diagram - coolant hoses

8 - Heater coolant shut-off valve - N279-

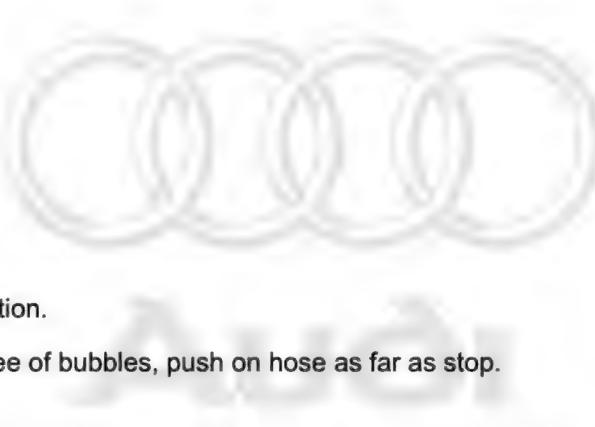
- Currently fitted on all vehicles with auxiliary heater
- Activated by auxiliary heater control unit - J364- in auxiliary heating mode until coolant temperature in auxiliary heater exceeds a certain value ⇒ Vehicle diagnostic tester ("Guided Fault Finding")
- Removing and installing ⇒ [page 78](#)

- ❑ Checking wiring ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ❑ Operation [⇒ page 16](#)
- ❑ Different versions, with 3 or 4 connections for coolant hoses. On the version with 4 connections, one connection is sealed with a cap. For correct version refer to ⇒ Electronic parts catalogue .



Note

Depending on the vehicle version, the engine installed, the coolant temperature and the setting on the air conditioner operating unit (Climatronic control unit - J255-), the heater coolant shut-off valve - N279- may also be activated by the auxiliary heater control unit - J364- with the auxiliary heater switched off. In this case, activation is in response to a request from the air conditioner operating unit (Climatronic control unit - J255-) via the data bus.



9 - Bleeder hole

Bleeding

- Unfasten the clamp.
- Pull off hose until bleeder hole is free of obstruction.
- As soon as coolant flowing out of vent hole is free of bubbles, push on hose as far as stop.
- Attach clamp at marked position.

3.2 Removing and installing heater coolant shut-off valve

[⇒ "3.2.1 Removing and installing heater coolant shut-off valve N279 ", page 78](#)

[⇒ "3.2.2 Removing and installing bracket for heater coolant shut-off valve N279 ", page 81](#)

3.2.1 Removing and installing heater coolant shut-off valve - N279-

Special tools and workshop equipment required

- ◆ Hose clamps up to Ø 25 mm - 3094-
- ◆ Hose clip pliers - VAS 6340-

Removing

- Switch off ignition (and auxiliary heater).
- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- Remove fresh air intake duct ⇒ Heating, air conditioning; Rep. gr. 87 ; Air duct system; Removing and installing fresh air intake .



WARNING

The cooling system is pressurised. When the engine is warm, the coolant temperature may be above 90 °C. Release pressure and wait for temperature to drop before performing repairs. Release pressure in coolant circuit by opening cap on coolant expansion tank ⇒ Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

- Release pressure in coolant circuit by opening cap on coolant expansion tank.



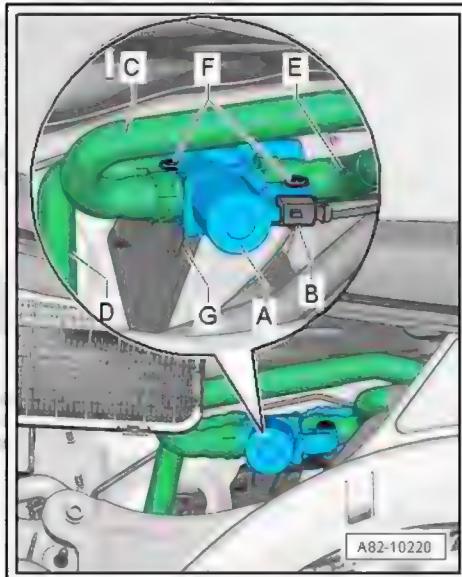
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- Unplug electrical connector -B-.
- Use an absorbent cloth or absorbent paper to cover area beneath heater coolant shut-off valve - N279- -A-.
- Mark arrangement of coolant hoses.



Caution

Ensure correct assignment of coolant hoses at heater coolant shut-off valve - N279-. If coolant hoses are interchanged, this can cause the heating in the passenger compartment to fail.



- Clamp off coolant hoses -C-, -D- and -E- in area of heater coolant shut-off valve - N279- -A- (e.g. with hose clamps up to Ø 25 mm - 3094-).
- Release clamps and detach coolant hoses -C-, -D- and -E- from heater coolant shut-off valve - N279- -A-.
- Remove bolts -F- and take out heater coolant shut-off valve - N279- -A-.

Installing

Install in reverse order of removal; note the following.

- Butt-joint coolant hoses -C-, -D- and -E- and secure with clamps.
- Bleed coolant circuit [⇒ page 81](#).
- If applicable, check activation and operation of heater coolant shut-off valve - N279- ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- Re-install remaining components (removed earlier).



Caution

Crushed coolant hoses may lead to failure of the passenger compartment heating on account of inadequate coolant flow.

Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Electronic parts catalogue .



Note

Make sure these components do not come into direct contact with the body or other parts.

Tightening torques

- ◆ [⇒ Fig. "Heater coolant shut-off valve -N279- with bracket"](#), [page 41](#)

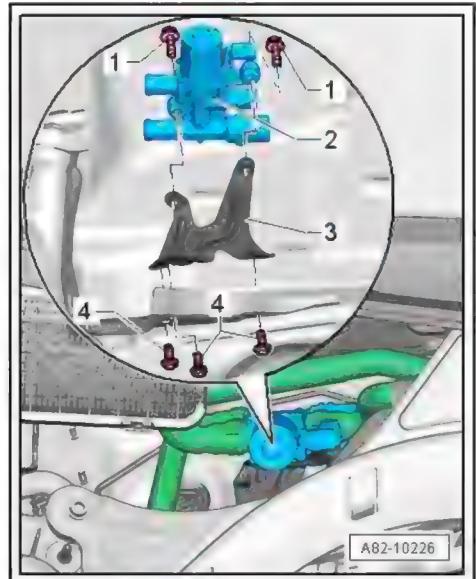
3.2.2 Removing and installing bracket for heater coolant shut-off valve - N279-



To remove the bracket -3-, it is not necessary to open the coolant circuit.

Removing

- Remove heater coolant shut-off valve - N279- [⇒ page 78](#).
- Remove plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber partition panel .
- Detach fresh air intake ⇒ Heating, air conditioning; Rep. gr. 87 ; Air duct system; Removing and installing fresh air intake .
- Remove combustion tube heat shields ⇒ General body repairs, exterior; Rep. gr. 66 ; Strips / trim panels / extensions; Exploded view - heat shield .
- Remove bolts -4- and detach bracket for heater coolant shut-off valve - N279- .



Installing

- Installation is performed in the reverse sequence.

Tightening torques

- ◆ [⇒ Fig. "Heater coolant shut-off valve -N279- with bracket"](#) [page 41](#)

3.3 Bleeding coolant circuit

- The steps for removing the components of the heater and air conditioning unit described in this Workshop Manual ensure that only a small quantity of air enters the coolant circuit. Therefore it is not necessary to completely drain and re-fill the system with coolant after removing and installing these components. It suffices to fill up and bleed the coolant circuit ⇒ Engine; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .
- However, if a large quantity of coolant has escaped due to another problem, e.g. a leaking hose, the coolant circuit must be bled completely ⇒ Engine; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

Requirement

- Most of the coolant circuit is filled with coolant; only a few air bubbles remain at a few locations in the coolant circuit.
- Fill up and bleed coolant circuit ⇒ Engine; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

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4 Fuel supply system

- ⇒ "4.1 Overview of fitting locations - fuel supply system", page 82
- ⇒ "4.2 Fuel take-off from fuel tank", page 85
- ⇒ "4.3 Checking fuel delivery rate", page 90
- ⇒ "4.4 Removing and installing metering pump V54", page 94
- ⇒ "4.5 Routing of fuel line to auxiliary heater", page 96
- ⇒ "4.6 Checking CO₂ content in auxiliary heater exhaust gas", page 98

4.1 Overview of fitting locations - fuel supply system

- ⇒ "4.1.1 Overview of fitting locations - fuel supply system", page 82
- ⇒ "4.1.2 Overview of fitting locations - fuel supply system, metering pump V54", page 84

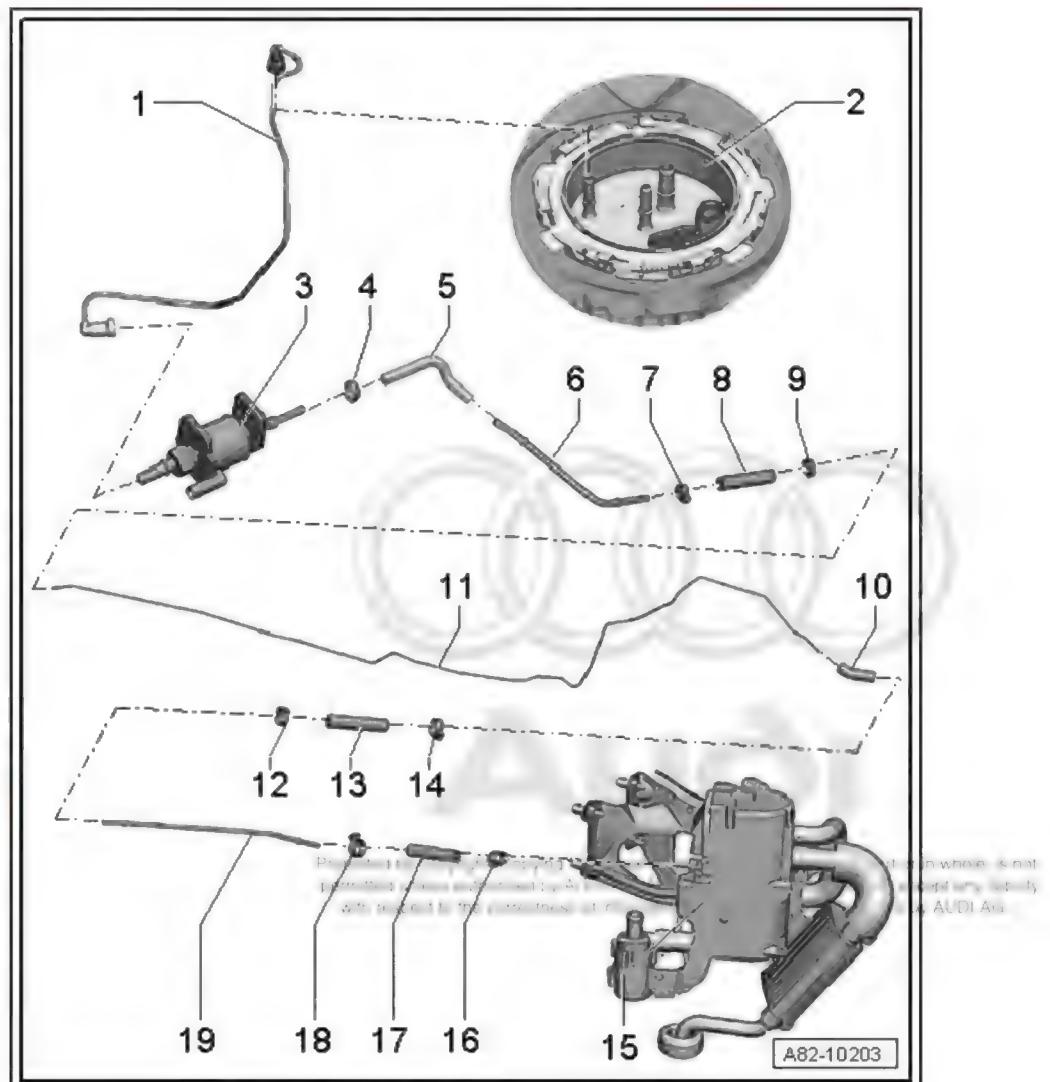
4.1.1 Overview of fitting locations - fuel supply system

1 - Fuel line with quick-release couplings

- Releasing quick-release coupling at fuel line for auxiliary heater at metering pump - V54
⇒ page 94
- Releasing quick-release coupling at fuel line for auxiliary heater at fuel delivery unit
⇒ page 87

2 - Fuel delivery unit with connection for fuel take-off for auxiliary heater

- Removing and installing
⇒ Rep. gr. 20 ; Fuel delivery unit/fuel gauge senders; Exploded view - fuel delivery unit/fuel gauge senders
- Fuel take-off from fuel tank ⇒ page 85
- Filling fuel line to metering pump - V54- with fuel (bleeding) ⇒ page 90
- Different fuel delivery units depending on version of vehicle (petrol or diesel engine) ⇒ Rep. gr. 20 ; Fuel delivery unit/fuel gauge senders; Exploded view - fuel delivery unit/fuel gauge senders



3 - Metering pump - V54-

- Removing and installing
[⇒ page 94](#)
- Checking fuel delivery rate [⇒ page 90](#) and ⇒ Vehicle diagnostic tester ("Guided Fault Finding")
- Checking activation ⇒ Vehicle diagnostic tester ("Guided Fault Finding")
- Different metering pumps depending on version of vehicle (petrol or diesel engine) ⇒ Electronic parts catalogue
- Some vehicle versions are fitted with noise insulation in the fuel line to the auxiliary heater in the vicinity of the metering pump - V54- to reduce noise

4 - Hose clip

5 - Fuel line

- (Hose from fuel line to auxiliary heater)

6 - Fuel line

- Routing of fuel line [⇒ page 96](#)
- The sections of the fuel line must be butt-jointed to stop vapour bubbles from accumulating at the connections.
- Filling fuel line to metering pump - V54- with fuel (bleeding) [⇒ page 90](#)
- Different fuel lines depending on version of vehicle (petrol or diesel engine, front-wheel drive or four-wheel drive) ⇒ Electronic parts catalogue

7 - Hose clip

8 - Fuel line

- (Hose from fuel line to auxiliary heater)

9 - Hose clip

10 - Protective hose

- Protects fuel line
- Protective hose must be fitted in a position where it protects the fuel line from pinching or chafing (this may vary from vehicle to vehicle)

11 - Fuel line

- Routing of fuel line [⇒ page 96](#)
- The sections of the fuel line must be butt-jointed to stop vapour bubbles from accumulating at the connections.
- Filling fuel line to metering pump - V54- with fuel (bleeding) [⇒ page 90](#)
- Different fuel lines depending on version of vehicle (petrol or diesel engine, front-wheel drive or four-wheel drive) ⇒ Electronic parts catalogue

12 - Hose clip

13 - Fuel line

- (Hose from fuel line to auxiliary heater)

14 - Hose clip

15 - Auxiliary heater

- Different versions depending on production period, version of vehicle and whether vehicle has petrol or diesel engine [⇒ page 2](#)
- Removing and installing [⇒ page 45](#)



Note

- ◆ This auxiliary heater is fitted in various vehicle models. The part number may change with each new vehicle model in which this auxiliary heater is installed. It is therefore important to observe the correct assignment. An old auxiliary heater version must never be installed in a vehicle that was previously fitted with a newer version ⇒ Electronic parts catalogue .
- ◆ On versions from part number -4H_xxx xxx- onwards, you must also make sure that it is correctly coded for the corresponding vehicle (different functions are stored in the control unit depending on the type of vehicle coded)
⇒ Vehicle diagnostic tester ("Guided Fault Finding").

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16 - Hose clip

17 - Fuel line

- (Hose from fuel line to auxiliary heater)

18 - Hose clip

19 - Fuel line

- Routing of fuel line ⇒ [page 96](#)
- The sections of the fuel line must be butt-jointed to stop vapour bubbles from accumulating at the connections.
- Filling fuel line to metering pump - V54- with fuel (bleeding) ⇒ [page 90](#)

4.1.2 Overview of fitting locations - fuel supply system, metering pump - V54-

-A- Quick-release coupling; unfastening ⇒ [page 94](#)

-B- Fastening elements

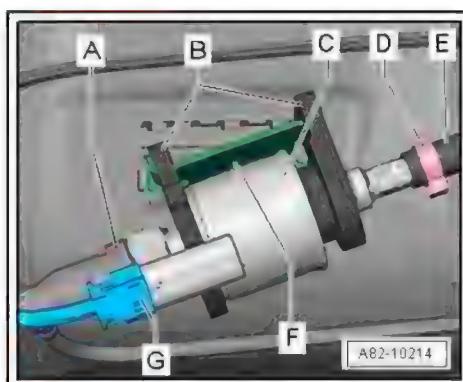
-C- Metering pump - V54-

-D- Clamp

-E- Fuel line

-F- Mounting

-G- Electrical connector



Note

Depending on the vehicle version, the fuel line -E- (hose between metering pump - V54- and fuel line to auxiliary heater) may be provided with a constriction (restrictor in hose for fuel line) to reduce noise or fitted with a noise damper (in the vicinity of the metering pump - V54- -C-).

4.2 Fuel take-off from fuel tank

- ⇒ "4.2.1 Fuel take-off from fuel tank", page 85
- ⇒ "4.2.2 Releasing quick-release coupling at fuel line for auxiliary heater at fuel delivery unit", page 87
- ⇒ "4.2.3 Fuel delivery unit in fuel tank", page 87
- ⇒ "4.2.4 Filling fuel line to metering pump V54 with fuel, bleeding", page 90

4.2.1 Fuel take-off from fuel tank



WARNING

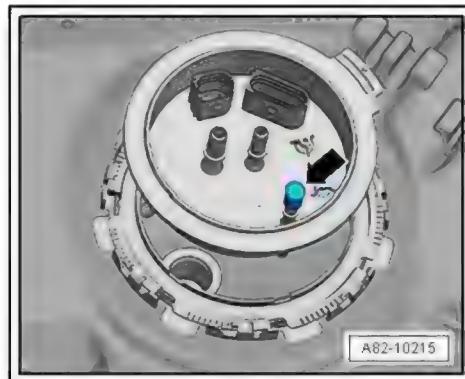
When working on the open fuel system, observe the rules for cleanliness and the safety precautions ⇒ page 24 and ⇒ Rep. gr. 00 ; Safety precautions; Safety precautions when working on the fuel supply system .



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 Note

- ◆ Air in the fuel supply to the auxiliary heater can lead to problems in auxiliary heater operation. To stop air from being drawn in by the metering pump - V54- and conveyed to the auxiliary heater when the auxiliary heater is first switched on after performing repairs on the fuel tank or the fuel delivery unit, the fuel take-off pipe must be filled with fuel (bled) after performing repairs in this area [⇒ page 90](#).
- ◆ To operate the auxiliary heater, fuel is extracted from a stable zone in the baffle housing of the fuel delivery unit in the fuel tank ⇒ Rep. gr. 20 ; Fuel delivery unit/fuel gauge sender; Exploded view - fuel delivery unit/fuel gauge sender.
- ◆ To ensure there is sufficient fuel for the operation of the auxiliary heater when the engine is stopped and the fuel tank is less than 1/2 full, the fuel system pressurisation pump - G6- in the baffle housing is activated as soon as auxiliary heating mode is started if the engine has not been running for a certain period (currently approx. 24 hours). To ensure that there is always a minimum quantity of fuel in the baffle housing, -G6- is activated intermittently during and at the end of auxiliary heating mode so that the baffle housing is refilled ⇒ Vehicle diagnostic tester ("Guided Fault Finding"). This also prevents the metering pump - V54- from drawing in air/fuel vapour instead of liquid fuel if the vehicle is awkwardly positioned with the fuel tank not completely full.
- ◆ To operate the auxiliary heater, liquid fuel has to be drawn in with no bubbles (air or fuel vapour) from the fuel tank by the metering pump - V54- and conveyed to the auxiliary heater. If air or vapour bubbles are conveyed by -V54- together with the liquid fuel, problems may occur during auxiliary heater operation (e.g. flame interruption during operation or no flame formation at the start of auxiliary heating mode ⇒ Vehicle diagnostic tester ("Guided Fault Finding")). If there are such problems, check the fuel conveyed in auxiliary heating mode. To do so, fit e.g. a section of transparent fuel line in the vicinity of the auxiliary heater. If bubbles are visible in this hose during auxiliary heater operation, determine and eliminate the cause of the bubbles in the fuel.
- ◆ Depending on the amount of fuel in the tank, problems may be encountered during heating operation if the fuel system pressurisation pump - G6- is not activated in auxiliary heating mode. There may be no supply of liquid fuel and the fault "Flame abort" may be entered ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ Vehicles without auxiliary heater are fitted with a fuel delivery unit with a sealed connection -arrow- or with no additional connection for "auxiliary heater" fuel take-off and no suction line in the fuel tank ⇒ Electronic parts catalogue .
- ◆ Butt-joint the fuel lines and secure with clamps at the marked locations.
- ◆ Fuel delivery unit in fuel tank [⇒ page 87](#)
- ◆ Filling fuel line to metering pump - V54- with fuel, bleeding [⇒ page 90](#)



4.2.2 Releasing quick-release coupling at fuel line for auxiliary heater at fuel delivery unit



WARNING

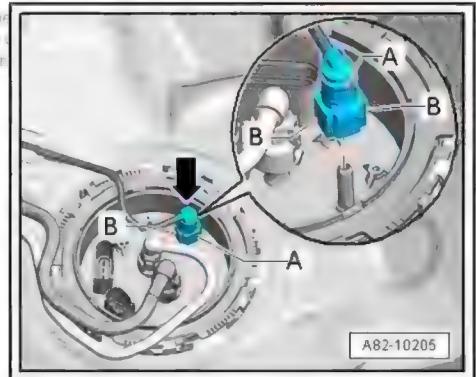
When working on the open fuel system, observe the rules for cleanliness and the safety precautions ⇒ Rep. gr. 00 ; Safety precautions; Safety precautions when working on the fuel supply system .

- Switch off ignition and auxiliary heater.
- Press quick-release coupling -A- for fuel line in direction of arrow- towards connection and hold in place.
- Switch off ignition and auxiliary heater.
- Release fastener on quick-release coupling by pressing and holding on area -B-.
- Detach quick-release coupling -A- with fuel line.
- Seal fuel line -A- and its connection.



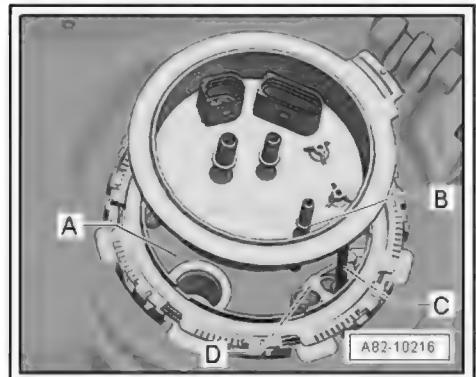
Note

Bleeding fuel lines after assembly ⇒ page 90



4.2.3 Fuel delivery unit in fuel tank

The fuel for the auxiliary heater is drawn in via the connection -B- and the riser -C- from a stable zone -D- in the baffle housing of the fuel delivery unit -A-.



 Note

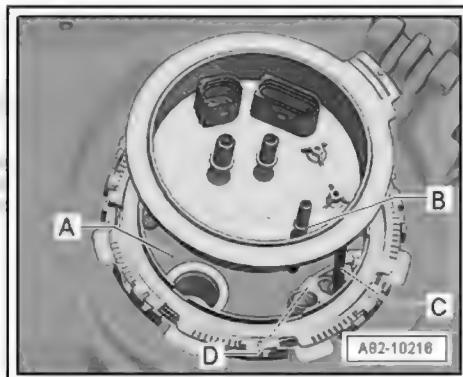
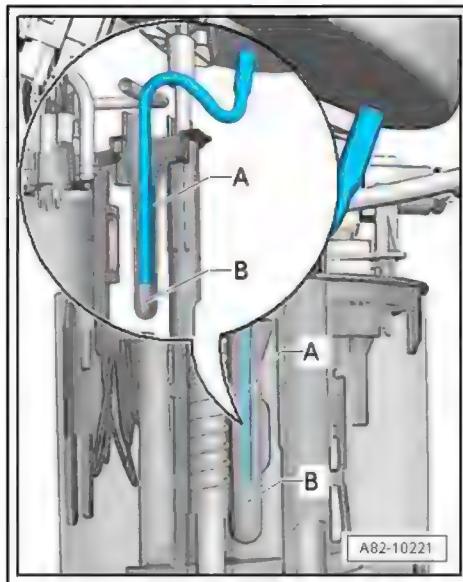
- ◆ The design of the fuel delivery unit and the location of the riser -A- differ depending on the vehicle model ⇒ Electronic parts catalogue .
- ◆ The following illustration shows the location of the riser -A- on a diesel engine from the model year 2011.
- ◆ Vehicles with diesel engine are not currently fitted with a strainer.



Caution

Problems occur with operation of auxiliary heater if riser -A- is not installed correctly.

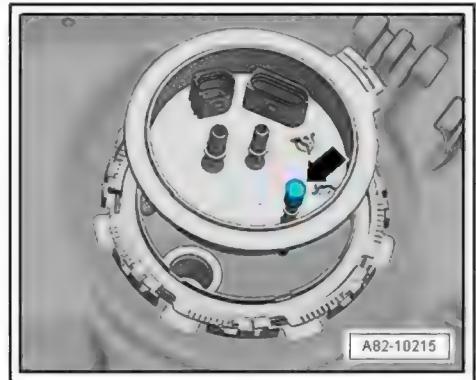
- ◆ If the riser -A- is not installed exactly in the specified stable zone -B- of the fuel delivery unit when the fuel delivery unit is installed, the metering pump - V54- can no longer draw in liquid fuel if, for example, the fuel tank is not completely full; this will lead to problems with the operation of the auxiliary heater.
- ◆ When fitting the fuel delivery unit, make particularly sure that the riser -A- is installed correctly ⇒ Rep. gr. 20 ; Fuel delivery unit/fuel gauge sender; Exploded view - fuel delivery unit/fuel gauge sender .





Note

- ◆ The riser -C- is secured in the baffle housing of the fuel delivery unit -A-. This ensures that the auxiliary/supplementary heater can still be operated even if the fuel tank is almost empty.
- ◆ To prevent an excessive drop in the fuel level in the baffle housing of the fuel delivery unit -C- in auxiliary heating mode, the fuel system pressurisation pump - G6- is activated briefly at the start of (depending on quantity of fuel in fuel tank and period for which vehicle has been standing), during and at the end of auxiliary heating mode ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ If the fuel tank is less than 1/4 full, vapour bubbles may form in the baffle housing of the fuel delivery unit -A- while the engine is running, particularly on vehicles with diesel engine. To prevent the metering pump - V54- from drawing in air bubbles while the engine is running, the riser -C- must be fitted in the stable zone -D-.
- ◆ To prevent the fuel tank from becoming completely drained in auxiliary heating mode, the auxiliary heater is no longer switched on if the fuel gauge in the instrument cluster is in the "red zone".
- ◆ If the auxiliary heater functions properly when the fuel tank is completely full or when the engine is running and problems are encountered if the fuel tank is only partially full after the engine has been stopped for a certain period (fault message "No flaming" or "Repeated flame abort"), this indicates that the suction line is routed incorrectly or that the bottom valve of the fuel delivery unit is leaking. If the baffle housing of the fuel delivery unit is leaking at the bottom valve, the fuel level will drop if the fuel tank is almost empty, and no further fuel can flow into the stable zone -D-. The fuel in the stable zone -D- will soon be used up, and this would result in failure of the auxiliary heater (e.g. due to flame interruption during operation). As the fuel system pressurisation pump - G6- currently is not always activated (in order to fill the baffle housing) even if the fuel tank is less than 1/2 full ⇒ [page 85](#), it might be advisable to shorten the time for which the engine must have been stopped so that -G6- is activated briefly when auxiliary heating mode is started ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ After removing and installing components of the fuel system, the fuel line to the metering pump - V54- must be filled with fuel ⇒ [page 90](#). The auxiliary heater must then be switched on and operated at full load for at least 10 minutes to make sure the fuel line is bled completely.
- ◆ On vehicles without "auxiliary heater" (fitted as an optional extra), the connection for the fuel take-off pipe must always be sealed with a cap -arrow-.

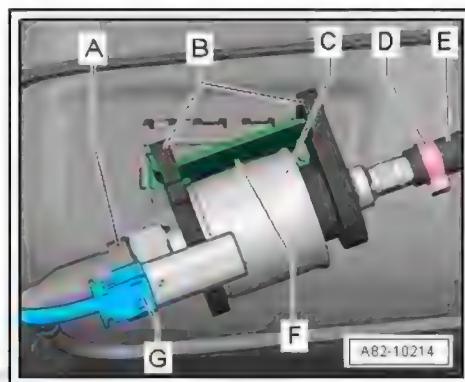


4.2.4 Filling fuel line to metering pump - V54- with fuel, bleeding



Note

- ◆ *Air/fuel vapour in the fuel supply to the auxiliary heater can lead to problems in auxiliary heater operation. To stop air/fuel vapour being drawn in by the metering pump - V54- and conveyed to the auxiliary heater when the auxiliary heater is first switched on after working on the fuel tank or fuel delivery unit, the fuel take-off pipe must be filled with fuel (bled) after working in this area.*
- ◆ *After working on the fuel system, switch on the auxiliary heater and let it run for at least 10 minutes at full load to check operation.*
- Auxiliary heater is switched off (metering pump - V54- is not activated).
 - Switch off ignition.
 - Unfasten quick-release coupling -A- [⇒ page 94](#) .
 - Connect quick-release coupling -A- for fuel line to diesel extraction unit - VAS 5226- .
 - Connect diesel extractor - VAS 5226- to workshop's compressed-air system ⇒ Fuel supply system; Rep. gr. 20 .
 - Completely fill fuel line with fuel by briefly extracting air.
 - Connect fuel line with quick-release coupling -A- to metering pump - V54- -C-.
 - After re-installing all the components removed previously, switch on the auxiliary heater and let it run at full load for approx. 10 minutes.



4.3 Checking fuel delivery rate

[⇒ "4.3.1 Test requirements", page 90](#)

[⇒ "4.3.2 Preparations", page 91](#)

[⇒ "4.3.3 Checking fuel delivery rate", page 91](#)

4.3.1 Test requirements



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When working on the open fuel system, observe the rules for cleanliness and the safety precautions [⇒ page 24](#) and [⇒ Rep. gr. 00 ; Safety precautions; Safety precautions when working on the fuel supply system](#).



Note

Fill fuel line completely

[⇒ "4.3.3 Checking fuel delivery rate", page 91](#)

- ◆ Coolant temperature below 30 °C
- ◆ Ambient temperature below 25 °C



Note

A higher ambient temperature can lead to incorrect measurements of the fuel quantity delivered due to fuel evaporation.

- Sufficient fuel in tank (fuel gauge in instrument cluster not in red zone)
- Battery - A- (vehicle battery) fully charged
- Auxiliary heater installed completely and connected to vehicle electrical system
- All auxiliary heater fuses OK (according to current flow diagram) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- Auxiliary heater switched off
- Event memory of all systems with self-diagnosis capability read out, cause of any faults displayed in vehicle systems eliminated and displayed event memory entries erased ⇒ Vehicle diagnostic tester ("Guided Fault Finding")



Note

Pay particular attention to the following vehicle systems: dash panel insert, air conditioner/heater electronics, auxiliary/supplementary heater and data bus diagnostic interface - J533- .

- Switch off ignition.

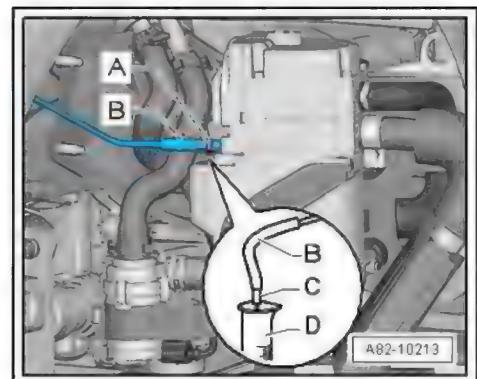
4.3.2 Preparations

- Remove wheel housing liner and wheel spoiler (front right) ⇒ General body repairs, exterior; Rep. gr. 66 - Wheel housing liners; Removing and installing wheel housing liner .
- Release hose clip -A-.
- Detach fuel line (hose to auxiliary heater) -B- from auxiliary heater.
- Hold fuel line (hose to auxiliary heater) -B- over measuring container -D-.



Note

If necessary, extend the fuel line (hose to auxiliary heater) -B- with a hose -C-.



4.3.3 Checking fuel delivery rate

Requirements satisfied ⇒ [page 90](#) and test preparation performed ⇒ [page 91](#) .

- Connect battery charger.
- Switch on ignition and switch off all electrical equipment.

 Note

The Guided Fault Finding for the auxiliary heater can only be started with the ignition switched on (the data bus diagnostic interface - J533- is only active when the ignition is on). After the auxiliary heater has switched to diagnosis mode, the Guided Fault Finding for the auxiliary heater can be continued even with the ignition switched off ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

- Select address word "Additional/auxiliary heater".
- Select function "Checking fuel delivery".

 Note

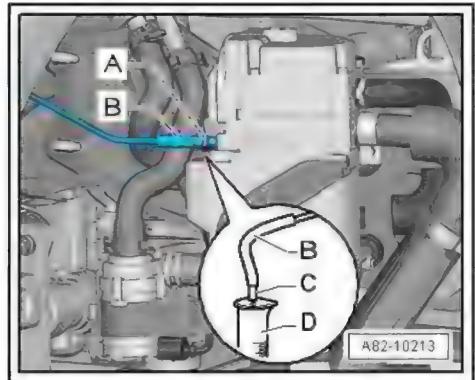
- ◆ The following description corresponds to the Guided Fault Finding test sequence.
- ◆ The "Pipe filling" cannot be aborted once it has started; it is implemented in full by the control unit regardless of any entries made via the tester.
- Follow the procedure in the "Checking fuel delivery" test routine.
- ◆ The fuel line is first completely filled. The metering pump - V54- is activated for 30 seconds at 8 hertz (8 pulses per second). The fuel delivery rate specified in the metering pump - V54- is approx. 0.028 ml per stroke (0.028/1000 litres) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- Wait until metering pump - V54- is no longer activated.

Protect the environment! Please do not dispose of old vehicles or batteries with household waste. Take old vehicles and batteries to an approved disposal site.

- Empty measuring container -D- and guide fuel line (hose to auxiliary heater) -B- into measuring container -D- again.
- Continue with "Checking fuel delivery rate" test routine.

The metering pump - V54- is activated for 240 seconds at 8 hertz (8 pulses per second). The fuel delivery rate specified in the metering pump - V54- is approx. 0.028 ml per stroke (0.028/1000 litres) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

- Wait until metering pump - V54- is no longer activated.
- Measure amount of fuel delivered by metering pump - V54- in measuring container -D-.



Note

One millilitre (ml) corresponds to 1/1000 litre or 1 cm³.

Specifications:

Diesel - 51 to 62 ml

Benzin - 48 to 58 ml

If the quantity of fuel delivered is outside the tolerance range:

- Check fuel line (from fuel tank via metering pump - V54- to auxiliary heater) for damage and proper routing ⇒ [page 96](#) .
- Check operation of fuel system pressurisation pump - G6- ⇒ Vehicle diagnostic tester ("Guided Fault Finding"), diagnostic system for drive system, and ⇒ [page 85](#) .

Note

The test routine for the fuel system pressurisation pump - G6- can be found under "Drive system" in the "Electrical components" of the engine ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

- If no fault is found, renew metering pump - V54- ⇒ [page 94](#) .
- If there are problems starting the auxiliary heater although the fuel delivery volume is OK, check the CO₂ content in the exhaust gas ⇒ [page 98](#) .

Note

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 If problems with auxiliary heater operation only occur when the engine is switched off and the fuel tank is less than half full, refer to ⇒ [page 85](#) .*

- If the quantity of fuel delivered is in the lower tolerance range (less than 52 ml for diesel engine/less than 49 ml for petrol engine) and there are problems starting the auxiliary heater, renew metering pump - V54- if applicable ⇒ [page 94](#) .
- Fit fuel hose to auxiliary heater and secure with a clamp of the same type.

4.4 Removing and installing metering pump - V54-

⇒ "4.4.1 Releasing quick-release coupling at fuel line for auxiliary heater at metering pump V54 ", page 94

⇒ "4.4.2 Removing and installing metering pump V54 ",
page 94

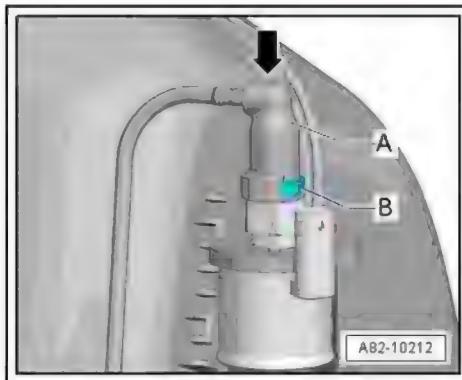
4.4.1 Releasing quick-release coupling at fuel line for auxiliary heater at metering pump - V54-



WARNING

When working on the open fuel system, observe the rules for cleanliness and the safety precautions ⇒ page 24 and ⇒ Rep. gr. 00 ; Safety precautions; Safety precautions when working on the fuel supply system .

- Press quick-release coupling -A- for fuel line in direction of -arrow- towards connection and hold in place.
- Switch off ignition and auxiliary heater.
- Release fastener on quick-release coupling by pressing and holding on area -B-.
- Detach quick-release coupling -A- with fuel line.
- Seal fuel line -A- and its connection.



4.4.2 Removing and installing metering pump - V54-



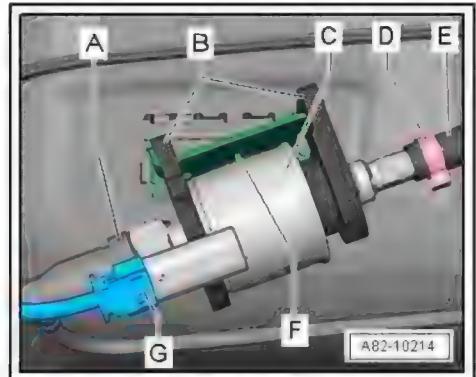
WARNING

When working on the open fuel system, observe the rules for cleanliness and the safety precautions ⇒ page 24 and ⇒ Rep. gr. 00 ; Safety precautions; Safety precautions when working on the fuel supply system .



Note

- ◆ Depending on the vehicle version, the fuel line -E- (hose between metering pump - V54- and fuel line to auxiliary heater) may be provided with a constriction (restrictor in hose for fuel line) to reduce noise or fitted with a noise damper (in the vicinity of the metering pump - V54- -C-).
- ◆ If fitted, the current dimensions of the restrictor in the fuel line -E- (hose between metering pump - V54- and fuel line to auxiliary heater) are as follows: outer diameter 5 mm, length 7 mm, bore 1.3 mm. The restrictor (or noise insulation) reduces the increase in pressure in the fuel line to the auxiliary heater during the working stroke of the metering pump - V54- -C-; this means that less operating noise is transmitted from the metering pump - V54-.
- ◆ Depending on the vehicle version, a strainer may be fitted between the connection for the metering pump - V54- -C- and the fuel line to the fuel tank to prevent dirt particles from entering the metering pump.

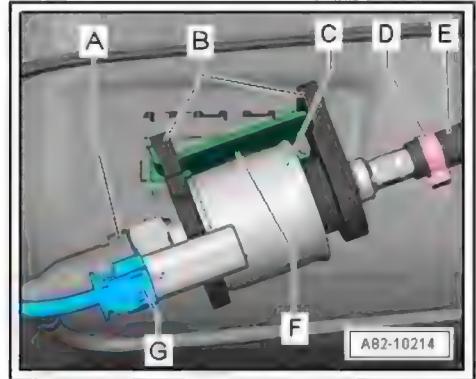


Removing

- Switch off ignition (and auxiliary heater).
- Remove cover (rear) for underbody (right-side) ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim .
- Unplug electrical connector -G- from metering pump - V54- -C-.
- Release fastening elements -B- from mounting -F-.
- Unfasten clamp -D-.
- Detach fuel line -E- from metering pump - V54- -C- and seal fuel line.
- Unfasten quick-release coupling -A- [page 94](#) and seal fuel line.

Installing

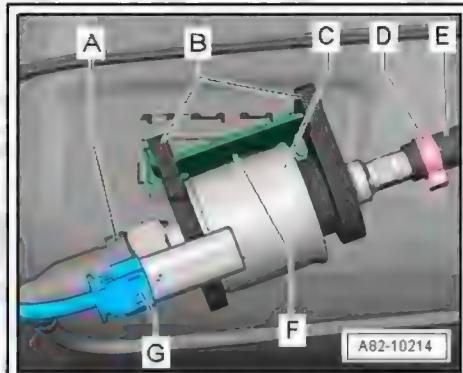
Install in reverse order of removal; note the following.



- Butt-joint fuel line -E-.
- Use suitable pliers to secure fuel line -E- with a clamp -D- of the same type ⇒ Electronic parts catalogue .

Pay attention to the following when installing the metering pump - V54- -C-:

- ◆ Fit metering pump - V54- -C- and corresponding fuel lines such that they do not make contact with other components (noise).
- ◆ Take care not to twist fuel lines.
- Fit wheel spoiler (rear right; with corresponding brackets in front of fuel tank) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (rear) .
- After renewing metering pump - V54- , switch on auxiliary heater and check operating sequence ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



 Note

After components of the fuel system have been removed and installed, the auxiliary heater must be switched on and operated at full load for at least 10 minutes to make sure that the fuel line is bled completely.

4.5 Routing of fuel line to auxiliary heater

 Note

Butt-joint fuel lines and secure with hose clips at marked locations.

The fuel line -A- between the metering pump - V54- and the auxiliary heater is routed along the underbody.

The retainers -B- secure the fuel line -A- to the auxiliary heater and the fuel lines to the engine in position.

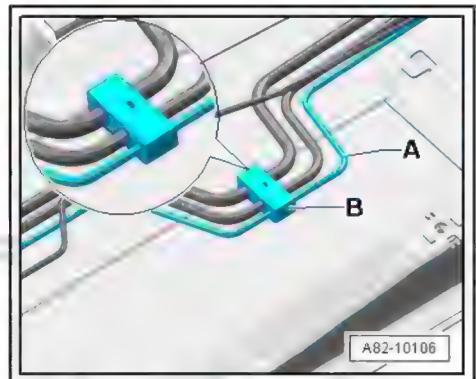
The fuel line -A- must be routed such that it does not make contact with components which can become hot, is protected against heat which could affect its operation and does not make contact with other components (noise).

- When installing fuel lines, make sure that they are butt-jointed.



Note

- ◆ *The fuel line must be flush with the underbody and protected against mechanical damage.*
- ◆ *The fuel line to the auxiliary heater must be protected against heat which could affect its operation.*
- ◆ *The fuel line must not make contact with moving components or components which can become hot.*
- ◆ *The fuel line to the auxiliary heater must be filled completely with fuel (bled).*
- ◆ *Vehicles with and without auxiliary heater have different fuel delivery units fitted in the fuel tank ⇒ Rep. gr. 20 ; Fuel delivery unit/fuel gauge sender; Exploded view - fuel delivery unit/fuel gauge sender and ⇒ Electronic parts catalogue .*
- ◆ *The sections of the fuel line must be butt-jointed to stop vapour bubbles from accumulating at the connections.*



4.6 Checking CO₂ content in auxiliary heater exhaust gas

⇒ “4.6.1 Checking CO₂ content in auxiliary heater exhaust gas”, page 98

⇒ “4.6.2 Test requirements”, page 98

⇒ “4.6.3 Checking CO₂ content”, page 99

4.6.1 Checking CO₂ content in auxiliary heater exhaust gas

CO₂ (carbon dioxide) content



Note

- ◆ For this test, the auxiliary heater can be switched on via the rotary pushbutton of the Multi Media Interface (MMI, control unit for front display and information control panel - J523-) or with the remote control. For activation with the remote control, the temperature setting on the air conditioner operating unit (Climatronic control unit - J255-) must be "Hi", otherwise (depending on the ambient temperature) the "auxiliary ventilation" function will be activated and the auxiliary heater will not start up.
- ◆ With the "Basic setting" function, the auxiliary heater can be operated up to a coolant temperature of 110 °C and starting from the control interval is possible. The operating time is then restricted to a maximum of 10 minutes ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ For notes on switching on the auxiliary heater via the "Basic setting" function, refer to e.g. the section "Checking CO₂ content in exhaust gas" of Guided Fault Finding; please also note the display of the activation signals for the auxiliary heater (e.g. in "General function check" in Guided Fault Finding) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

4.6.2 Test requirements

- ◆ Coolant temperature below 30 °C at start of check
- ◆ Ambient temperature below 25 °C
- Sufficient fuel in tank (fuel gauge in instrument cluster not in red zone)
- Battery - A- (vehicle battery) fully charged
- Auxiliary heater installed completely and connected to vehicle electrical system
- All auxiliary heater fuses OK (according to current flow diagram) ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- Auxiliary heater switched off
- Event memory of all systems with self-diagnosis capability read out, cause of any faults displayed in vehicle systems eliminated and displayed event memory entries erased ⇒ Vehicle diagnostic tester ("Guided Fault Finding")



Note

Pay particular attention to the following vehicle systems: dash panel insert, air conditioner/heater electronics, auxiliary/supplementary heater and data bus diagnostic interface - J533-.

4.6.3 Checking CO₂ content

Special tools and workshop equipment required

- ◆ **Vehicle diagnostic tester** and the required software modules for the vehicle in question
- ◆ **Exhaust emission test station** VAS 6300
- ◆ **Battery charger** - VAS 5903-

Requirements satisfied [⇒ page 98](#)

- Connect battery charger.
- Connect vehicle diagnostic tester to diagnostic connection in vehicle.



Note

The Guided Fault Finding for the auxiliary heater can only be started with the ignition switched on (the data bus diagnostic interface - J533- is only active when the ignition is on). After the auxiliary heater has switched to diagnosis mode, the Guided Fault Finding for the auxiliary heater can be continued even with the ignition switched off.

- Select address word "Supplementary/auxiliary heater" ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- Select function "Interrogate event memory" ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- Erase event memory if necessary ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- Check coding and correct if necessary ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- Select function "Check CO₂ content of exhaust gas" or "Basic setting" ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



Note

The following description corresponds to the Guided Fault Finding test sequence.

- Switch on exhaust emission test station - VAS 6300- and insert exhaust probe -B- in exhaust pipe -A- of auxiliary heater.

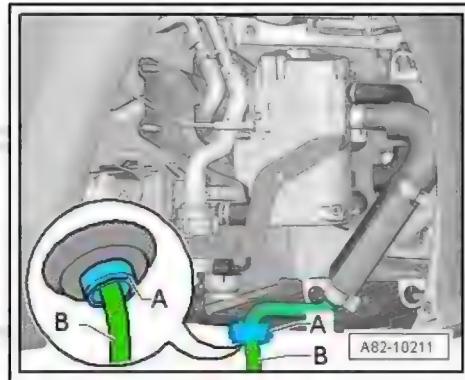
 Note

- ◆ It is not necessary to remove the wheel housing liner and the wheel housing spoiler (front right).
- ◆ Hose -B- of exhaust probe must not prevent exhaust gas from leaving exhaust pipe -A- during check.



WARNING

When pulling out the exhaust probe, take care not to touch the exhaust probe of the exhaust emission test station - VAS 6300- or the exhaust pipe as these become very hot.



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- Set air conditioner operating unit (Climatronic control unit - J255-) to maximum heat output ("HI" temperature setting).
- Restrict fresh air blower speed by setting air conditioner operating unit (Climatronic control unit - J255-) to approx. 50 % of maximum fresh air blower speed.
- ◆ The auxiliary heater is switched on via the "Basic setting" function ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

 Note

For notes on switching on the auxiliary heater via the "Basic setting" function, refer to e.g. the section "Checking CO₂ content in exhaust gas" of Guided Fault Finding; please also note the display of the activation signals for the auxiliary heater (e.g. in "General function check" in Guided Fault Finding) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

- Wait until auxiliary heater switches from starting to full load operation (auxiliary heater must be at full load approx. 4 minutes after it is switched on).

 Note

- ◆ If the connector for the heater coolant shut-off valve - N279- is unplugged, the engine is also heated up and the auxiliary heater runs longer at full load.
- ◆ With the "Basic setting" function, the auxiliary heater can be operated up to a coolant temperature of 110 °C and starting from the control interval is possible. The operating time is then restricted to a maximum of 10 minutes ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

- Wait at least four more minutes after the auxiliary heater has started running at full load.
- Read off measured value for CO₂ (carbon dioxide) content of exhaust gas from CO₂ measuring instrument.

Specifications:

- ◆ 8 to 11 % by CO₂ volume for vehicles with diesel engine
- ◆ 7.5 to 10.5 % by CO₂ volume for vehicles with petrol engine



Note

- ◆ If measured value is in lower range (less than 9 % for diesel or less than 8.5 % for petrol), problems may occur with auxiliary heater combustion under unfavourable conditions, e.g. high vehicle speed with auxiliary heater switched on. Check fuel delivery rate of metering pump - V54- [⇒ page 90](#).
- ◆ If CO₂ values displayed by measuring instrument only fluctuate slightly, calculate mean value from highest and lowest measured value.
- ◆ If measured values displayed for CO₂ fluctuate considerably (more than approx. +/- 0.6 % depending on measuring equipment), check position of measurement probe in auxiliary heater exhaust pipe.
- ◆ The auxiliary heater is switched off via the "Basic setting" function after measurement is complete ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- If applicable, plug connector back in at heater coolant shut-off valve - N279- .
- Interrogate event memory and erase if necessary ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

If the measured value is outside the permitted range:

- Check intake air noise insulation and exhaust system of auxiliary heater for contamination or cross-sectional constriction; clean or renew these components if necessary [⇒ page 59](#) and [⇒ page 63](#).
- Check fuel delivery rate of metering pump - V54- [⇒ page 90](#).
- If CO₂ content of exhaust gas and fuel delivery rate of metering pump - V54- are in lower specified range, renew metering pump - V54- [⇒ page 94](#).

If the CO₂ content of the exhaust gas is not OK although the fuel delivery rate is OK:

- Check intake air noise insulation and exhaust system of auxiliary heater for contamination or cross-sectional constriction; clean or renew these components if necessary [⇒ page 59](#) and [⇒ page 63](#).

If the CO₂ content of the exhaust gas is not OK and no fault can be found:

- Check combustion air blower - V6- ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and [⇒ page 70](#).

If there are problems starting the auxiliary heater although the fuel delivery volume and the CO₂ content in the exhaust gas are OK:

- Check glow plug for heater - Q9- and fuel pre-heating heater element - Z66- ⇒ Vehicle diagnostic tester ("Guided Fault Finding"), [⇒ page 71](#) and [⇒ page 75](#).



Note

If problems with auxiliary heater operation only occur when the engine is switched off and the fuel tank is less than half full, refer to [⇒ "4.2.1 Fuel take-off from fuel tank", page 85](#).



Audi A6 2011 ► , Audi A6 China 2012 ► , Audi A7 Sportback 2011 ►

Auxiliary/supplementary heater - Edition 10.2017

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5 Auxiliary/supplementary heater control

⇒ "5.1 Functional description", page 103

⇒ "5.2 Switching auxiliary/supplementary heater on and off", page 104

5.1 Functional description



Note

- ◆ The "auxiliary heating" function can be switched on and off using auxiliary heater remote control ⇒ [page 115](#) or on the Multi Media Interface (MMI) (control unit for front display and information control panel - J523-) ⇒ Infotainment / MMI Operating Manual and ⇒ [page 107](#).
- ◆ Various functions of the auxiliary heater and air conditioner are adjusted on the Multi Media Interface (MMI). In the event of problems with auxiliary heater control or heating output, you should therefore check these settings on the MMI ⇒ [page 2](#) ⇒ Owner's Manual and ⇒ "Infotainment/MMI" Operating Manual.
- ◆ If the "Auxiliary heating / auxiliary ventilation" function is called up via the remote control for auxiliary heater or the Multi Media Interface (MMI, control unit for front display and information control panel - J523-), the air conditioner operating unit (Climateronic control unit - J255-) determines on the basis of the "specified temperatures" and the "actual temperature" measured whether the "auxiliary heating" or just the "auxiliary ventilation" function needs to be activated.
- ◆ Depending on the amount of heat generated by the auxiliary heater (and engine) and emitted by the heat exchangers of the air conditioning unit, the heater may remain at full load, part load (controlled operation) or in the control interval for a lengthy period.
- ◆ To ensure that combustion in the heater always remains in the optimum range, the metering pump - V54- (clock frequency) and combustion air blower - V6- (voltage) are regulated over the entire sequence.
- ◆ If the heater has been interlocked due to a fault, the event memory must be read out and the content of the event memory erased. Depending on the cause of the fault, it may also be necessary to cancel the interlock via the "Adaption" function ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ If the first attempted start fails to produce a flame, the auxiliary heater control unit - J364- terminates the sequence and attempts a restart after any combustion residue has been blown out with the combustion air blower - V6-. The auxiliary heater control unit - J364- is switched off if the restart also fails to produce a flame. The heater is disabled after three attempted starts (each with one restart) where operation is unsuccessful.
- ◆ If the heater is switched off during the starting process, the heater is either immediately switched off or switches to run-on mode (burn-off, cooling) if necessary, depending on the point reached in the starting sequence.
- ◆ If the coolant temperature exceeds 89 °C before full load is reached (e.g. with a hot engine), the heater switches to the control interval.

- ◆ Various functions of the auxiliary heater are constantly monitored during operation (the auxiliary heater is switched off as soon as a fault occurs).
- ◆ Auxiliary heating operation can be monitored via the vehicle diagnostic tester ("Read measured values" function) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ The temperatures given in the following operating sequences are approximate. The actual temperatures at which the various functions are switched on and off may differ depending on the version of the vehicle and the characteristic curves stored in the auxiliary heater control unit - J364- .
- ◆ On vehicles with a start/stop system, the circulation pump - V55- of the auxiliary heater is activated by the auxiliary heater control unit - J364- while the stop function is active. The auxiliary heater control unit - J364- is requested to switch on - J255- via the data bus by the air conditioner operating unit (Climatronic control unit - V55-) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

5.2 Switching auxiliary/supplementary heater on and off

⇒ "5.2.1 Overview - activation of auxiliary heater with remote control", page 104

⇒ "5.2.2 Activation of auxiliary heater with remote control", page 106

⇒ "5.2.3 Switching auxiliary heating / auxiliary ventilation on and off via Multi Media Interface (MMI, control unit for front display and information control panel J523) ", page 107

5.2.1 Overview - activation of auxiliary heater with remote control

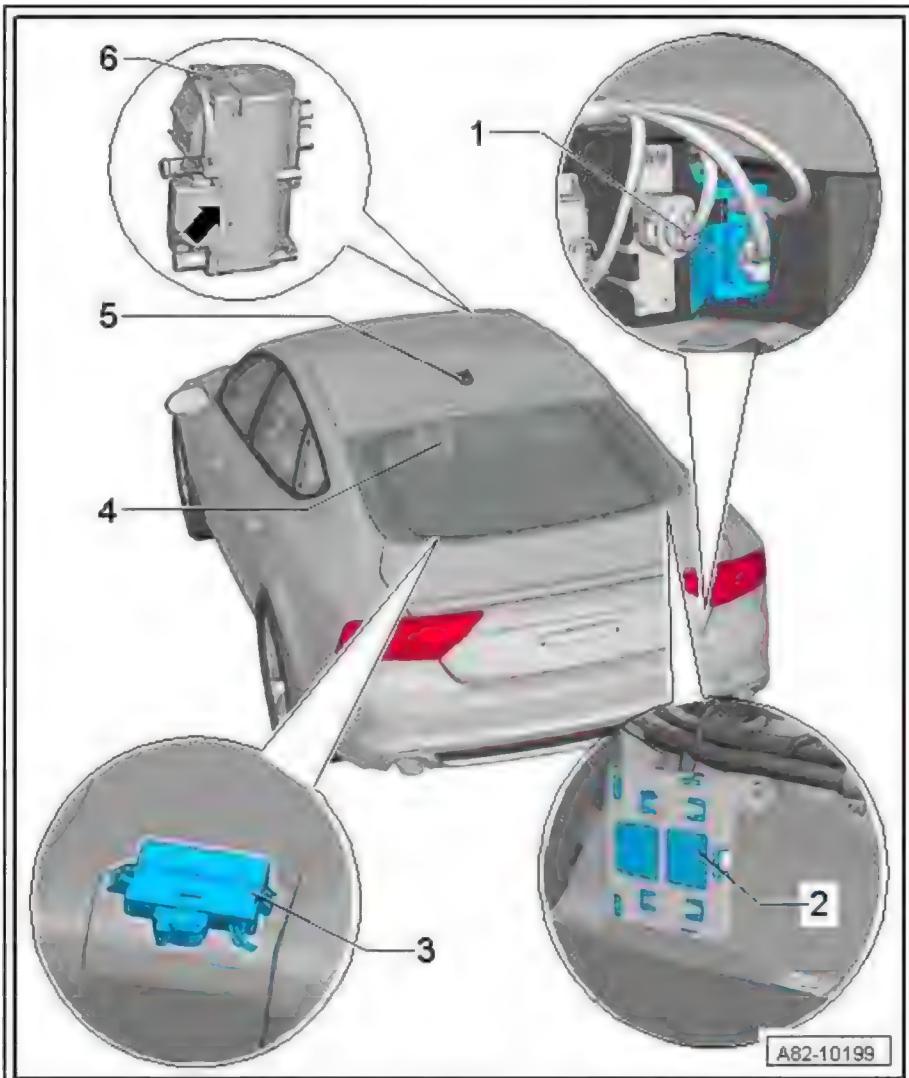


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1 - Remote control receiver for auxiliary heater - R64-

There are different versions of the remote control receiver and the hand-held transmitter for remote control for the auxiliary heater ⇒ Electronic parts catalogue

- Removing and installing [⇒ page 110](#)
- Functional description of remote control for auxiliary/supplementary heater [⇒ page 111](#)
- Adapting remote control for auxiliary/supplementary heater to remote control receiver [⇒ page 119](#)
- When radio signals (switching auxiliary heating/auxiliary ventilation on/off) are received, the remote control receiver for auxiliary heater - R64- transmits the information to the auxiliary heater control unit - J364- .
- The feedback from the remote control receiver for auxiliary heater - R64- is supplied by the auxiliary heater control unit - J364- to the hand-held transmitter for remote control.
- The remote control receiver can be switched off by the auxiliary heater control unit - J364- (thus reducing the no-load current input, e.g. in transport mode, to relieve the load on the battery - A- until the vehicle is returned to the customer) ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- In idle mode, the current input of the remote control receiver for auxiliary heater - R64- is less than 1 mA. The current input increases as soon as a transmission signal is received.
- The remote control can be switched off by the auxiliary heater control unit - J364- (thus reducing no-load current input).



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Note

- ◆ *The remote control for auxiliary heater is adapted in the remote control receiver for auxiliary heater - R64- and not in the auxiliary heater control unit - J364- .*
- ◆ *The remote control signals are only relayed by the remote control receiver for auxiliary heater - R64- . The auxiliary heater control unit - J364- then processes the signals and relays them to the operating unit of the Climatronic control unit - J255- .*

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- ◆ There are different versions of the hand-held transmitter for remote control and the remote control receiver for auxiliary heater - R64- ; make sure that these components are combined correctly with each other and with the air conditioner operating unit (Climatronic control unit - J255-). There might be malfunctions if the wrong components are installed together
⇒ [page 115](#) and ⇒ [Electronic parts catalogue](#)

2 - Convenience system central control unit - J393-

- Activation of various vehicle systems ⇒ Vehicle diagnostic tester ("Guided Fault Finding")

3 - Data bus diagnostic interface - J533-

- Data bus link between various control units ⇒ Vehicle diagnostic tester ("Guided Fault Finding")

4 - Heated rear window - Z1-

- Activation of -Z1- is not influenced by the auxiliary heater

5 - Roof aerial - R216-

- Receives radio signals from remote control units
- Relays radio signals to remote control receiver for auxiliary heater - R64- via aerial wire

6 - Auxiliary heater control unit - J364-

- Different versions, pay attention to correct version ⇒ [Electronic parts catalogue](#)

5.2.2 Activation of auxiliary heater with remote control



Note

- ◆ A signal (switching on/off) is transmitted by the hand-held transmitter for remote control for the auxiliary heater to the remote control receiver for auxiliary heater - R64- . The air conditioner operating unit (Climatronic control unit - J255-) determines whether auxiliary heating mode is required to attain the specified temperature in the passenger compartment or whether auxiliary ventilation mode is sufficient.
- ◆ There are different versions of the hand-held transmitter for remote control and the remote control receiver for auxiliary heater - R64- ; make sure that these components are combined correctly with each other and with the air conditioner operating unit (Climatronic control unit - J255-). There might be malfunctions if the wrong components are installed together
⇒ [page 115](#) and ⇒ [Electronic parts catalogue](#)

If an activation signal is transmitted to the auxiliary heater via the remote control for auxiliary heater, the air conditioner operating unit (Climatronic control unit - J255-) determines whether to operate the auxiliary ventilation or auxiliary heating.

Auxiliary ventilation mode

- ◆ The air conditioner operating unit (Climatronic control unit - J255-) determines that auxiliary heating mode is not required to attain the specified temperature. -J255- starts up without transmitting a request for activation of the auxiliary heater via



the data bus to the auxiliary heater control unit - J364- (auxiliary ventilation mode).

Auxiliary heater mode

- ◆ The air conditioner operating unit (Climatronic control unit - J255-) determines that auxiliary heating mode is required to attain the specified temperature. -J255- transmits the request for activation of the auxiliary heater via the data bus to the auxiliary heater control unit - J364- . The auxiliary heater control unit - J364- switches on the auxiliary heater (auxiliary heater mode). It informs -J255- as soon as the coolant temperature in the auxiliary heater exceeds approx. 40 °C; -J255- then starts up.

5.2.3 Switching auxiliary heating / auxiliary ventilation on and off via Multi Media Interface (MMI, control unit for front display and information control panel - J523-)

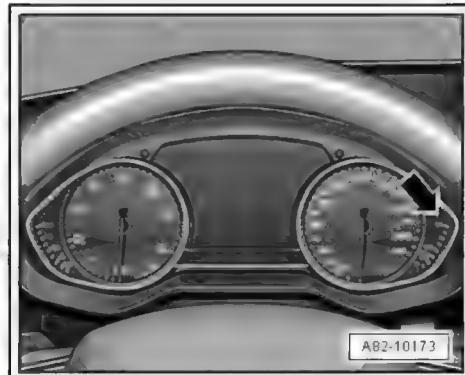


Potentially dangerous situations due to sudden switching on of the auxiliary heater
When driving in cold weather, the auxiliary heater can switch on automatically
without prior programming if the ambient temperature falls below a certain limit. Audi AG

- ◆ The "Immediate on" and "Timer" functions can be called up via the Multi Media Interface (MMI, control unit for front display and information control panel - J523-). The auxiliary heating or auxiliary ventilation is switched on depending on the ambient temperature and the temperature selected on the air conditioner operating unit (Climatronic control unit - J255-).
- ◆ Depending on vehicle version, equipment, production period and the setting in the Multi Media Interface (MMI), certain auxiliary heater functions can also be switched on and off via the programmable steering wheel button ⇒ Owner's Manual and ⇒ Infotainment/MMI Operating Manual .

Requirements:

- The auxiliary heater has been adapted in the air conditioner operating unit (Climatronic control unit - J255- ; check and perform coding if necessary) ⇒ Heating, air conditioning; Rep. gr. 87 ; Operating and display unit; Removing and installing operating and display unit and ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- The auxiliary heating/auxiliary ventilation can only be switched on by the auxiliary heater control unit - J364- if there is enough fuel in the fuel tank. When the ignition is on, the fuel gauge in the instrument cluster -arrow- must not be in the "red zone" ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- There must not be any entries in the event memory of the auxiliary heater control unit - J364- ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- The battery - A- (vehicle battery) must be charged sufficiently.
- There must not be any faults in the vehicle data bus ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- Transport mode and component protection for auxiliary heater must not be active ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



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Switching on auxiliary heating/auxiliary ventilation via "Immediate on" function

- Switch on ignition.
- Using the controls of the Multi Media Interface (MMI, control unit for front display and information control panel - J523-) select: function selector button **CAR** > "Car systems" > "Auxiliary heating" > "Activate auxiliary heating", and then set the required operating time ⇒ Infotainment/MMI Operating Manual .

Switching off auxiliary heating / auxiliary ventilation via "Immediate on" function

- Using the controls of the Multi Media Interface (MMI, control unit for front display and information control panel - J523-) select: function selector button **CAR** > "Car systems" > "Auxiliary heating" > "Deactivate auxiliary heating" ⇒ Infotainment/ MMI Operating Manual .

Switching on auxiliary heating / auxiliary ventilation via "Timer" function

- Switch on ignition.
- De-icing vehicle windows only: Using the controls of the Multi Media Interface (MMI, control unit for front display and information control panel - J523-) select: function selector button **CAR** > "Car systems" > "Auxiliary heating" > "Heating effect" > "defrost" ⇒ Infotainment/MMI Operating Manual .
- De-icing vehicle windows and heating up passenger compartment: Using the controls of the Multi Media Interface (MMI, control unit for front display and information control panel - J523-) select: function selector button **CAR** > "Car systems" > "Auxiliary heating" > "Heating effect" > "warm" ⇒ Infotainment/ MMI Operating Manual .
- Using the controls on the Multi Media Interface (MMI, control unit for front display and information control panel - J523-) select the following: Function selector button **CAR** > "Car systems" > "Auxiliary heater" > "Program timers", e.g. "Timer 1: target time" ⇒ Infotainment/MMI Operating Manual .
- Set the time and date.

- To activate the timer, confirm your entry by pressing the rotary pushbutton ⇒ Infotainment/MMI Operating Manual .



Note

- ◆ If the auxiliary heater (auxiliary heater control unit - J364-) is activated via the "Timer" function, the air conditioner operating unit (Climatronic control unit - J255-) determines whether auxiliary heating mode is required to attain the specified temperature or whether auxiliary ventilation mode is sufficient.
- ◆ If the timer function is active, the control unit in dash panel insert - J285- activates the air conditioner operating unit (Climatronic control unit - J255-) and the onboard supply control unit - J519- via the data bus approx. 50 minutes before the selected time. -J519- determines the current charge status of the battery - A-, uses this to determine the permissible auxiliary heating/auxiliary ventilation operating time and then transmits this value to -J285- via the data bus. If the battery - A- is not charged sufficiently, for example, the auxiliary heating (auxiliary ventilation) is not switched on or the operating time for the auxiliary heating (auxiliary ventilation) is shortened such that the battery - A- is not excessively discharged (this may mean that the temperature specified for the passenger compartment is no longer attained). On the basis of the prevailing conditions (e.g. ambient temperature and passenger compartment temperature), -J255- determines whether auxiliary heating mode is required to attain the specified temperature or whether auxiliary ventilation mode is sufficient. If auxiliary heating mode is required, -J255- calculates the auxiliary heating time needed to attain the desired passenger compartment temperature at the specified time and transmits this value to -J285- via the data bus. Depending on the ambient conditions, the auxiliary heater is then activated immediately (at very low temperatures) or the data bus is deactivated again by -J285- for the period prior to the calculated activation time. At the calculated cut-in point, the data bus is activated again by -J285- and -J255- is switched on. -J255- starts up (no obvious outward signs) and activates the auxiliary heater. The data bus is likewise deactivated if -J255- determines that auxiliary ventilation mode is sufficient to attain the specified temperature. Only approx. 15 minutes before the specified time, -J255- is activated for auxiliary ventilation mode by -J285- via the data bus and -J255- starts up in "Auxiliary ventilation" mode.
- ◆ In the "Timer" function, auxiliary heating mode and auxiliary ventilation mode are switched off approx. 10 minutes after the specified time. As the operating time is limited to a maximum of 60 minutes, the auxiliary heater is activated no sooner than 50 minutes before the specified time even at very low ambient temperatures.

6 Further control components

- ⇒ "6.1 Removing and installing ambient temperature sensor",
page 110
- ⇒ "6.2 Removing and installing remote control receiver for auxiliary heater R64", page 110
- ⇒ "6.3 Functional description of remote control for auxiliary/supplementary heater", page 111
- ⇒ "6.4 Adaption of remote control for auxiliary heater",
page 119

6.1 Removing and installing ambient temperature sensor

The ambient temperature sensor - G17- is required for the calculation of the ambient temperature so that the auxiliary heater can be regulated.

- Removing and installing ambient temperature sensor - G17-
⇒ Heating, air conditioning; Rep. gr. 87 ; Further control components; Removing and installing ambient temperature sensor - G17-
- Checking ambient temperature sensor - G17- ⇒ Vehicle diagnostic tester ("Guided Fault Finding")

6.2 Removing and installing remote control receiver for auxiliary heater - R64-

- If control unit is being renewed, select function "Replace" for corresponding control unit in "Guided Fault Finding" or "Guided Functions" mode ⇒ Vehicle diagnostic tester.

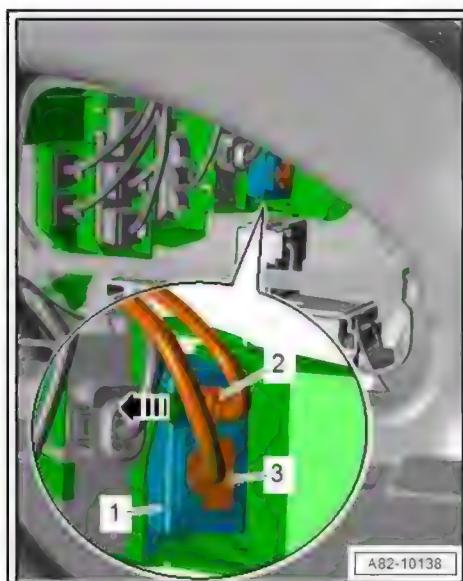
Removing

Protective cover for rear side trim in luggage compartment right side. It is not
permitted to damage the protective cover. Damage to the protective cover may affect the
correctness of information in this document. © Copyright by AUDI AG

- Remove cover from luggage compartment side trim (right side).
- Detach electrical connector -3- and aerial wire -2-.
- Release retaining tab -arrow- and pull remote control receiver for auxiliary heater -1- out of retaining frame (top).

Installing

Installation is carried out in reverse sequence.



6.3 Functional description of remote control for auxiliary/supplementary heater

- ⇒ ["6.3.1 Switching on auxiliary heating/auxiliary ventilation via Immediate on function", page 111](#)
- ⇒ ["6.3.2 Switching off auxiliary heating / auxiliary ventilation via Immediate on function", page 112](#)
- ⇒ ["6.3.3 Switching on auxiliary heating / auxiliary ventilation via Timer function", page 113](#)
- ⇒ ["6.3.4 Switching off auxiliary heating / auxiliary ventilation with Timer function", page 114](#)
- ⇒ ["6.3.5 Remote control for auxiliary heater", page 115](#)
- ⇒ ["6.3.6 Display of fault conditions on remote control for auxiliary heater", page 117](#)
- ⇒ ["6.3.7 Renewing battery of remote control for auxiliary heater", page 118](#)

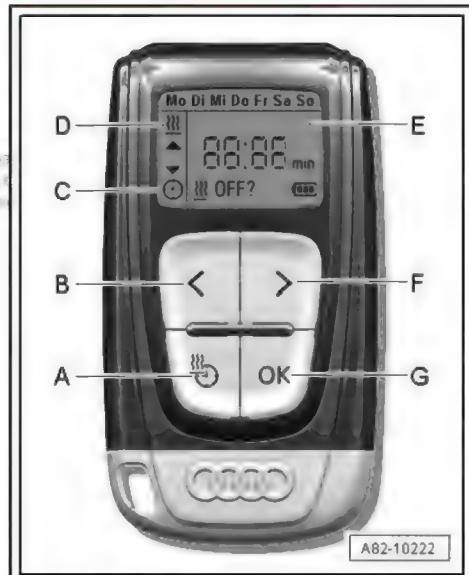
6.3.1 Switching on auxiliary heating/auxiliary ventilation via "Immediate on" function

- The remote control is activated by pressing button -A-.
- The "Immediate on" function is selected with button -A- (the arrow points to -D- in the remote control display).
- The required operating time is set with buttons -B- and -F- (in 10-minute increments).
- The auxiliary heater/auxiliary ventilation is activated by pressing button -G-.



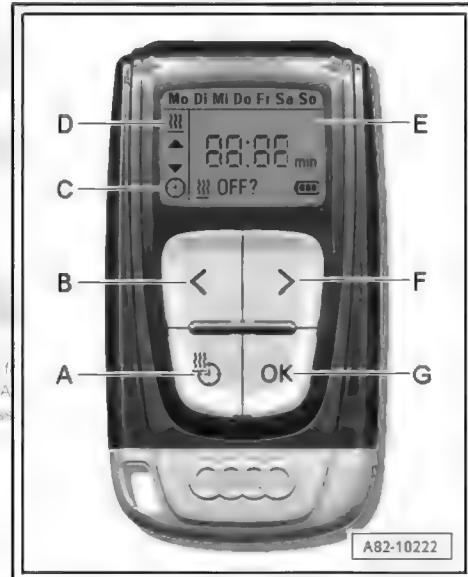
Note

- ◆ *The request for activation is transmitted after button -G- is pressed. The data transfer symbol (aerial) appears on the remote control display.*
- ◆ *If the cut-in signal is received correctly by the auxiliary heater control unit - J364- in the vehicle and there are no faults in the auxiliary heater, feedback is sent to the remote control and the auxiliary heater/auxiliary ventilation is activated. The operating time or remaining running time appears on the remote control display.*
- ◆ *Heating is not possible if the vehicle battery charge level is too low, if there are any event memory entries in the auxiliary heater control unit - J364- or if there is not enough fuel in the tank. A feedback signal is sent to the remote control and the cause of the problem is indicated on the display ⇒ [page 117](#).*
- ◆ *If the vehicle is outside the range of the remote control, "No radio link with vehicle" is displayed as feedback ⇒ [page 117](#).*
- ◆ *The LCD of the remote control for auxiliary heater is automatically switched off 8 seconds after the last button has been pressed. Pressing button -A- activates the remote control for auxiliary heater and the remaining running time is displayed ⇒ [Owner's Manual](#).*



6.3.2 Switching off auxiliary heating / auxiliary ventilation via "Immediate on" function

- The remote control for auxiliary heater is activated by pressing button -A-.
- The auxiliary heater can be switched off by pressing button -G-, irrespective of the operating time.

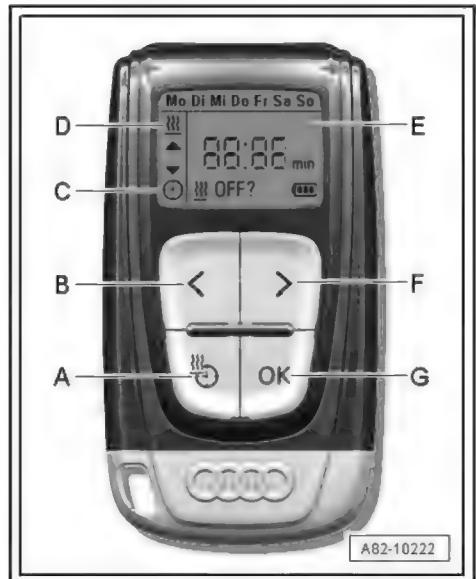


6.3.3 Switching on auxiliary heating / auxiliary ventilation via "Timer" function

- The remote control is activated by pressing button -A-.
- The "Timer" function is selected with button -A- (the arrow points to -C- in the remote control display).
- The required "hour" setting is selected with buttons -B- and -F-.
- Switch to the "minute" setting by pressing button -G-.
- The required "minute" setting is selected with buttons -B- and -F-.
- Switch to the "day" setting by pressing button -G-.
- The required "day" setting is selected with buttons -B- and -F-.
- Confirm the programming by pressing button -G-.

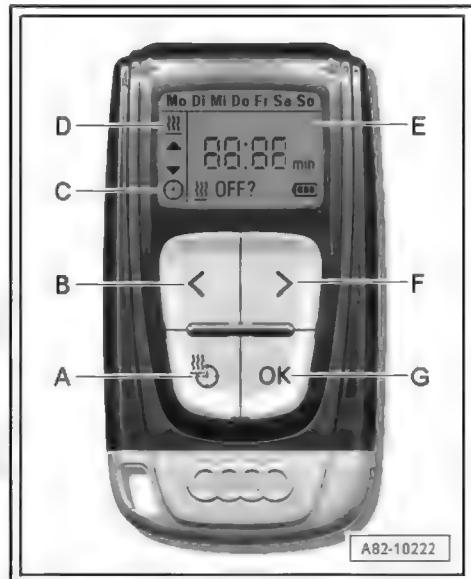
 Note

- ◆ *The entry is transmitted after button -G- is pressed. The data transfer symbol (aerial) appears on the remote control display.*
- ◆ *If the cut-in signal is received correctly by the auxiliary heater control unit - J364- and there are no faults in the auxiliary heater, a feedback signal is sent to the remote control for auxiliary heater. The time setting appears on the remote control display.*
- ◆ *Heating is not possible if the vehicle battery charge level is too low, if there are any event memory entries in the auxiliary heater control unit - J364- or if there is not enough fuel in the tank. A feedback signal is sent to the remote control and the cause of the problem is indicated on the display*
[⇒ page 117](#).
- ◆ *If the vehicle is outside the range of the remote control, "No radio link with vehicle" is displayed as feedback*
[⇒ page 117](#).
- ◆ *The timer programmed with the remote control for auxiliary heater is always displayed in the Multi Media Interface (MMI, control unit for front display and information control panel - J523-, "Auxiliary heating" function) as "Timer 1". If "Timer 1", "Timer 2" or "Timer 3" has already been activated via the Multi Media Interface (MMI, control unit for front display and information control panel - J523-, "Auxiliary heater" function), the new programming using the remote control overwrites the previously activated timer; this is then displayed in the Multi Media Interface (MMI, control unit for front display and information control panel - J523-, "Auxiliary heater" function) as "Timer 1".*
- ◆ *The display of the remote control for auxiliary heater is automatically switched off 8 seconds after the last button has been pressed. Pressing button -A- reactivates the remote control for auxiliary heater and the timer programming or - if the auxiliary heater has already been activated - the remaining running time is displayed.*
- ◆ *If the auxiliary heater (auxiliary heater control unit - J364-) is activated via the "Timer" function, the air conditioner operating unit (Climatronic control unit - J255-) determines whether auxiliary heating mode is required to attain the specified temperature or whether auxiliary ventilation mode is sufficient.*



6.3.4 Switching off auxiliary heating / auxiliary ventilation with "Timer" function

- The remote control is activated by pressing button -A-.
- The auxiliary heater can be switched off by pressing button -G- again, irrespective of the timer programming selected ⇒ Owner's Manual .



For more detailed information about the remote control refer to section 6.3.1
For more detailed information about the auxiliary heater refer to section 6.3.2
With respect to the programming of the timer refer to the Owner's Manual of your Audi.

6.3.5 Remote control for auxiliary heater



Note

- ◆ The Audi A6 and Audi A7 are currently always supplied with the remote control for auxiliary heater (with display) ⇒ Electronic parts catalogue.
- ◆ A brief description of the operation of the remote control is given below. For a detailed description refer to the owner's literature for your vehicle ⇒ Owner's Manual.
- ◆ The functions "Immediate on" and "Timer" can be called up using the remote control for auxiliary heater. The auxiliary heating or auxiliary ventilation is switched on depending on the ambient temperature and the temperature selected on the air conditioner operating unit (Climatronic control unit - J255-).
- ◆ The auxiliary heater can be switched on and off immediately using the remote control for auxiliary heater. The auxiliary heater or auxiliary ventilation is activated depending on the ambient temperature and the temperature setting on ~J255-.
- ◆ If the auxiliary heater (auxiliary heater control unit - J364-) is activated by a cut-in signal from the remote control for auxiliary heater, the remote control receiver for auxiliary heater - R64- initially activates -J364- . -J364- then transmits the information "Activate or deactivate auxiliary heating/auxiliary ventilation" via the data bus to the air conditioner operating unit (Climatronic control unit - J255-). -J255- then determines whether auxiliary heating mode is required to attain the specified temperature or whether auxiliary ventilation mode is sufficient.
- ◆ The remote control for auxiliary heater has a range of approx. 700 - 1000 metres. This may be considerably reduced by obstacles (e.g. buildings) between the remote control and the vehicle.
- ◆ There are different versions of the remote control for auxiliary heater (hand-held transmitter for remote control and remote control receiver for auxiliary heater - R64-) and the air conditioner operating unit (Climatronic control unit - J255-). It is therefore important to ensure that these components are correctly assigned. Malfunctions may occur if the wrong components are installed together or if the coding or adaption are incorrect ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ Up to model year 2011, hand-held transmitters for remote control with dark lettering and a red display -A- were used (part number 4H0 963 511 without index). From model year 2012 onwards, hand-held transmitters for remote control with white lettering on a dark background -B- and with part number 4H0 963 511 with index "A" are being introduced gradually. At a later date (gradual introduction on Audi A6 and Audi A7, exact date not yet finalised), hand-held transmitters for remote control with white lettering on a dark background -B- and with part number 4H0 963 511 from index "B" onwards will be introduced. The two versions of the hand-held transmitter with white lettering on a dark background -B- have different functions.



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- ◆ The two versions of the remote control with white lettering on a dark background -B- can only be distinguished by certain features on the display (as described in the following). On these part numbers with index "A", the lines underneath the day display appear immediately after the ON button is pressed. On versions with part number from index "B" onwards, the time that the lines underneath the day display take to appear depend on the version of the remote control receiver for auxiliary heater - R64- installed in the vehicle.
- ◆ If a remote control from index "B" onwards recognises from the radio signal from -R64- that the vehicle is fitted with an -R64- with part number 4H0 963 271 up to index "C" (gradual introduction on Audi A6 and Audi A7 up to model year 2014, exact date not yet finalised), the lines underneath the day display appear immediately after the ON button of the hand-held transmitter is pressed. If the radio signal identifies an -R64- with part number 4H0 963 271 from index "D" onwards (gradual introduction on Audi A6 and Audi A7 from model year 2014 onwards, exact date not yet finalised), the lines underneath the day display do not appear on the display until approx. 2 seconds after the ON button of the hand-held transmitter has been pressed.
- ◆ The part number of the hand-held remote control transmitter is given on a sticker on the battery carrier -C-.
- ◆ The two versions of the hand-held transmitter with white lettering on a dark background -B- also have different functions. For example, on the version with part number 4H0 963 511 from index "B" onwards, it is possible to set the "Timer function" with the auxiliary heater switched on. However, this function (and other new ones) can only be implemented if an air conditioner operating unit (Climatronic control unit - J255-) with part number from index "AJ" onwards (can be seen e.g. from **A/C** button) and a remote control receiver for auxiliary heater - R64- with part number 4H0 963 271 from index "D" onwards are fitted (exact date of introduction for Audi A6 and Audi A7 not yet finalised, gradual introduction planned from model year 2014 onwards) ⇒ Electronic parts catalogue .
- ◆ The remote control receiver for auxiliary heater - R64- exchanges data with the air conditioner operating unit (Climatronic control unit - J364-) via the auxiliary heater control unit - J255- .
- ◆ Vehicles with an air conditioner operating unit (Climatronic control unit - J255-) with part number up to index "AH" (can be seen e.g. from **AC** button) must only be fitted with a remote control receiver for auxiliary heater - R64- with part number 4H0 963 271 up to index "C" (exact date of introduction for Audi A6 and Audi A7 not yet finalised, gradual introduction planned from model year 2014 onwards) ⇒ Electronic parts catalogue .
- ◆ Vehicles with an air conditioner operating unit (Climatronic control unit - J255-) with part number from index "AJ" onwards (can be seen e.g. from **A/C** button) must only be fitted with a remote control receiver for auxiliary heater - R64- with part number 4H0 963 271 from index "D" onwards (exact date of introduction for Audi A6 and Audi A7 not yet finalised, gradual introduction planned from model year 2014 onwards) ⇒ Electronic parts catalogue .
- ◆ Make sure the hand-held transmitters for remote control and the remote control receiver for auxiliary heater - R64- are correctly assigned. Hand-held remote control transmitters with part number without index or with index "A" can exchange data correctly with a -R64- with part number 4H0 963 271 up to index "C". Certain data cannot be exchanged with a -R64- with part number 4H0 963 271 from index "D" onwards.

- ◆ Hand-held remote control transmitters with part number from index "B" onwards can exchange data correctly with an -R64- with part number 4H0 963 271 up to index "C" and from index "D" onwards. These hand-held transmitters can identify the version via the signal from -R64- and adapt their transmission signal accordingly.

Functions of hand-held remote control transmitter



Note

- ◆ The main functions of the remote control are listed in the following. For a detailed functional description of this remote control, refer to the ⇒ Owner's Manual .
- ◆ The LCD of the remote control is activated by pressing button -A-.

-A- Activation of remote control and selection of menus ("Immediate on" and "Timer")

-B- Down button

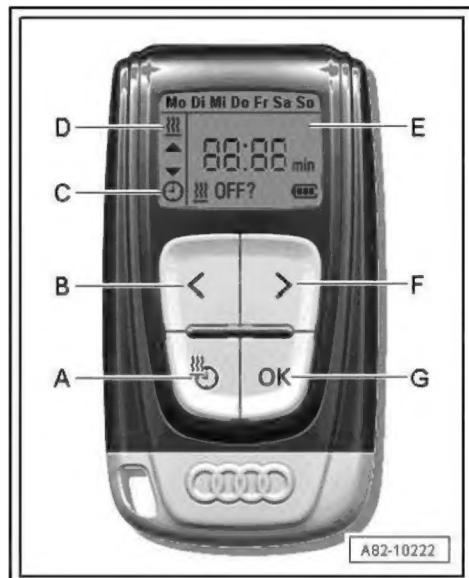
-C- "Timer" display

-D- "Immediate on" display

-E- LCD

-F- Up button

-G- Activation/deactivation of auxiliary heater with required operating time and timer programming



6.3.6 Display of fault conditions on remote control for auxiliary heater

Heating not possible:

-A- Not enough fuel in the tank



Note

When the ignition is switched on, the fuel gauge in the instrument cluster must not be in the "red zone".

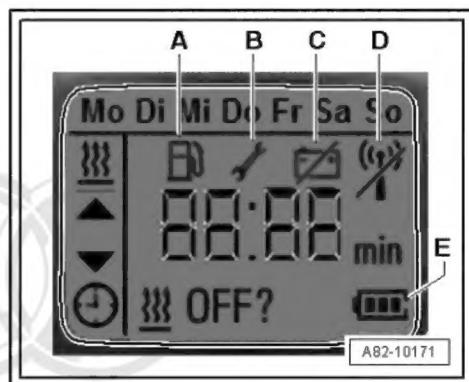
-B- Event memory entry in auxiliary heater control unit - J364-

-C- Vehicle battery charge level too low

-D- No radio link with vehicle (outside range)

Battery capacity:

-E- Battery capacity of remote control





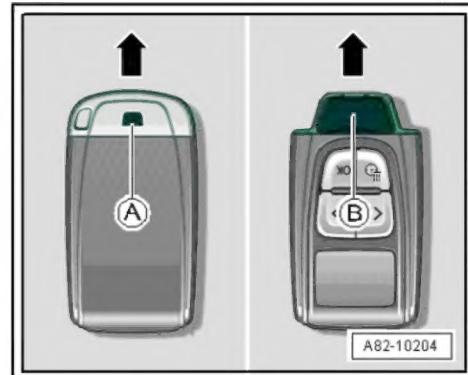
6.3.7 Renewing battery of remote control for auxiliary heater

- Press release tab -A- and detach cover in direction of -arrow-.
- Press release tab -B- on battery carrier and pull out battery carrier in direction of -arrow-.
- Fit new battery with "positive terminal" facing downwards.



Note

- ◆ Only fit batteries with specifications corresponding to the original battery (e.g. CR2430 3V 280mAh). You can obtain these batteries e.g. from specialised dealers or via the replacement parts programme ⇒ Electronic parts catalogue .
- ◆ Pressing any button on the remote control for auxiliary heater activates the LCD. Repeated unintentional activation of the LCD (e.g. while in your pocket) will shorten battery service life.



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6.4 Adaption of remote control for auxiliary heater



Note

- ◆ The remote control for auxiliary heater should be held upright (transmission aerial upwards) while pressing the buttons.
- ◆ Currently up to four remote controls can be adapted in the remote control receiver for auxiliary heater - R64- (via auxiliary heater control unit - J364-). If a fifth remote control is adapted, the first remote control to be adapted is deleted ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ The remote control for auxiliary heater is adapted in the remote control receiver for auxiliary heater - R64-. If this is renewed, all remote controls must be re-adapted [⇒ page 106](#).
- ◆ There are different versions of the remote control receiver for auxiliary heater - R64-. You must therefore make sure that the remote control is correctly assigned and that the auxiliary heater is coded correctly ⇒ Electronic parts catalogue,
⇒ "[6.3.5 Remote control for auxiliary heater](#)", [page 115](#) and
⇒ Vehicle diagnostic tester ("Guided Fault Finding"). There might be malfunctions if the wrong components are installed together.
- ◆ The remote control for auxiliary heater can be adapted with the "Adapt radio remote control" function via the auxiliary heater control unit - J364- ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ As the battery of the remote control for auxiliary heater becomes weaker, the transmission power of the remote control deteriorates as does the reception quality indicated by the auxiliary heater control unit - J364-. The current battery capacity is indicated in the display of the remote control [⇒ page 117](#). The reception quality of the transmission signal is displayed in the "Read measured values" function of the auxiliary heater control unit - J364- ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- ◆ The code of each remote control for auxiliary heater is stored in the remote control receiver for auxiliary heater - R64- .
- ◆ If there are problems with the link between the hand-held transmitter for remote control and the remote control receiver for auxiliary heater - R64-, check the aerial and its connection to the remote control receiver for auxiliary heater - R64- ⇒ Vehicle diagnostic tester ("Guided Fault Finding") and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- ◆ Should it not be possible to switch on the auxiliary heater using the remote control for auxiliary heater, check the fuel level in the fuel tank (the fuel gauge in the instrument cluster must not be in the "red zone" when the ignition is switched on) and the operating status of the vehicle (transport mode must not be active). If these two shut-off criteria were recently active, e.g. on a new vehicle, it may be necessary to briefly interrupt the power supply to the auxiliary heater and the remote control receiver for auxiliary heater - R64- to restore the normal function (auxiliary heater "reset").

Requirement

The remote control to be used must be coded in the auxiliary heater control unit - J364- .

- If applicable, check coding and remote control receiver for auxiliary heater - R64- and code auxiliary heater control unit -

J364- accordingly (different versions) ⇒ Electronic parts catalogue and ⇒ Vehicle diagnostic tester ("Guided Fault Finding").

Adapting remote control for auxiliary heater

- Connect battery charger.
- Switch on ignition and switch off all electrical equipment.
- On vehicle diagnostic tester, select "Supplementary/auxiliary heater" ⇒ Vehicle diagnostic tester ("Guided Fault Finding").
- Select "Adapt radio remote control" function and follow program sequence indicated on display ⇒ Vehicle diagnostic tester ("Guided Fault Finding").



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